BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Increase Its Revenues For Electric Service	)))	**Case No. ER-2012-0166**

NOTICE

On August 15, 2012, I received the attached document by email from a former employee of Ameren, Lawrence Criscione of Springfield, Illinois. Ameren is a party in the above noted case currently before the Commission.

The Missouri Public Service Commission ("Commission") has promulgated rules denoted as the "Standards of Conduct" at 4 CSR 240-4.010 and 4.020. Section 4 CSR 240-4.20 specifically deals with Ex Parte and Extra-Record Communication Rules. This notice is filed in conformance with the rule.

Respectfully Submitted,

Terry M. Jarrett

Terry M. Jarrett
Commissioner

Dated at Jefferson City, Missouri
On this 16th day of August, 2012

Hurt, Erica

From:	Lawrence Criscione [lscriscione@hotmail.com]
Sent:	Wednesday, August 15, 2012 11:27 AM
To:	bill.borchardt@nrc.gov; chairman@nrc.gov; hubert.bell@nrc.gov; Jeanette Oxford; Gunn, Kevin; Mills, Lewis
Cc:	william.ostendorff@nrc.gov; david.lee@nrc.gov; rossana.raspa@nrc.gov; mark.banks@nrc.gov; roy.zimmerman@nrc.gov; elmo.collins@nrc.gov; Tony Vegel; geoffrey.miller@nrc.gov; david.dumbacher@nrc.gov; jeremy.groom@nrc.gov; john.kramer@nrc.gov; nick.taylor@nrc.gov; Mohan Thadani; phillip.niedzielski-eichner@nrc.gov; Jarrett, Terry; Kenney, Robert; stephen.stoll@psc.mo.gov; Michal Freedhoff; Marty Gelfand; Admiral Ellis; Dave Lochbaum
Subject:	10CFR2.206 Request Concerning Inaccurate QA Records at Callaway Plant
Attachments:	10CFR2-206 Petition Regarding Inaccurate Information in Quality Assurance Records at Callaway Plant.pdf

All,

On October 21, 2003 Callaway Plant was lowering in power in preparation for a potential forced outage when, around 10:18 am, the reactor inadvertently passively shut down and the NRC licensed operators failed to notice it for 67 minutes - until the first Source Range Nuclear Instrument energized at 11:25 am. Since the plant's upper management was not expecting the reactor to shut down until noon, the operators did not immediately insert the control banks. Instead, for 40 minutes they informally relied on Xenon-135 (i.e. without a Shutdown Margin calculation) to maintain the reactor subcritical. When they commenced inserting the control banks at 12:05 pm, no one outside of the operators in the Main Control Room was made aware of the fact that, instead of using the control banks to manually shut down the reactor, the control banks were being inserted into a reactor core which had passively shut down 107 minutes earlier.

The Operations Manager (David Neterer, who is currently the Plant Director at Callaway Plant) was performing an observation in the Main Control Room at 11:25 am when the crew first became aware the reactor was no longer critical. Instead of ensuring the operators immediately inserted the control rods to properly shut down the reactor, he allowed them to drag their feet for 40 minutes in order to conceal the incident from his superiors. When the incident was uncovered in February 2007, Mr. Neterer actively inhibited its investigation. On September 5, 2007, David Lantz (who was the Shift Manager during the incident and is currently the Operations Training Manager at Callaway Plant) entered an inaccurate account of the incident in a Quality Assurance record and on April 1, 2008 lied under oath during an interview with the NRC's Office of Investigations.

The allegations in the above two paragraphs are quite serious, yet difficult to prove. I do not expect any of you to take them as truth just because I have made them. Unlike me, none of you have ever worked for Ameren. None of you have stood watch with Mr. Lantz on the back shift. None of you have personally witness him cover up other incidents. None of you were present when Mr. Neterer came to the Main Control Room and chewed me out in the kitchen for requesting the October 21, 2003 key card data for the Main Control Room security door. But all of you are capable of recognizing that false statements have been made by Mr. Lantz under oath. And all of you are capable of recognizing that Ameren's investigation of this incident has been woefully inadequate.

I am submitting the attached document as a 10CFR2.206 Petition. The request in the petition is really quite petty: that the NRC cite Callaway because nearly five years ago a NRC licensed operator at Callaway Plant intentionally entered inaccurate information into a Quality Assurance record regarding a passive reactor shutdown which occurred nearly 9 years ago. My main reason for pursuing this issue is because I have grave concerns about the US NRC's ability to enforce adequate standards of integrity and technical prowess in the individuals to whom it grants Senior Reactor Operators licenses.

What does not require any proof at all are the sworn statements made by the NRC licensed operators in 2008. During their 2008 testimonies to the NRC Office of Investigations the NRC licensed operators claimed:

1. They recognized the reactor passively shutting down and did not use the control rods to actively drive the reactor shutdown because they were busy responding to the letdown isolation.

2. As the reactor passively lowered into the source range with its control rods still at their critical rod heights, they did not actively drive the shutdown because they believed the remaining steps of the off-normal procedure for a loss of a safety-related instrument bus (which had been entered two hours earlier) took precedence over inserting the control banks.
3. With reactor power in the source range and no Source Range Nuclear Instruments energized, they (i.e. the Senior Reactor Operators - Lantz and Rauch) informally relied on the passive buildup of a radioactive waste gas (Xenon-135) to keep the reactor from inadvertently restarting while they assigned their Reactor Operators to perform equipment alignments on secondary and tertiary plant systems.

At the NRC we recognize that the above three items are wholly unacceptable with regard to accepted standards of performance for safe reactor plant operations, yet because all of the above fall through loopholes in our regulations, we feel bound to ignore them. The American public expects better of us. They expect us to be vigilant regulators, not cowardly bureaucrats. They expect us to find a way to punish operators and utilities who - through either gross incompetence or dishonesty - fail to conservatively control the nuclear fission reaction and fail to document and address significant human performance errors. They don't expect us to bureaucratically find loopholes for the utility in order to justify unacceptable performance.

Several of you on this email have operated reactor plants and know what a physically trivial - yet vitally important - activity it is to manually insert the control rods into a shutdown reactor core: Mr. Borchardt, Commissioner Ostendorff, Admiral Bowman, Admiral Ellis, Mr. Zimmerman, Mr. Collins, Mr. Vegel, Mr. Miller, Mr. Dumbacher, Mr. Kramer, Mr. Taylor, Mr. Groom, Dr. Corcoran, Mr. Mullins, Mr. Merschoff, Mr. Blanch and possibly some others. I encourage you to read the attached 10CFR2.206 petition and its enclosures. It should be evident to any of you who have operated a reactor that:

- On October 21, 2003 the operators at Callaway Plant failed to recognize the passive shutdown of the reactor until the first Source Range Nuclear Instrument energized nearly an hour after the reactor went subcritical.
- Informally relying on Xenon-135 for 40 minutes (from 11:25 am to 12:05) to maintain the reactor subcritical - while the NRC licensed operators conducted non-emergent alignments to ventilation system and feed system components with the reactor in the source range and with its control rods still at their critical rod heights - was wholly irresponsible and demonstrates a gross disregard for conservative control of core reactivity.
- Statements made by David Lantz in Action 5 of CAR 200702606 (a Quality Assurance record) were inaccurate and incomplete.
- Statements made by David Lantz (under oath) in his April 1, 2008 interview by the Office of Investigations were inaccurate and incomplete.

Although you recognize the four items above, none of you can prove them. In this case, it is nearly impossible to prove what was occurring in the minds of the Callaway Plant operators. But using your expertise, you can certainly subjectively judge how you would have reacted to the events had you recognized the reactor had passively shut down.

Proof is only necessary in a criminal case. And even then, iron clad proof is not necessary; for a criminal preceding to succeed it is merely necessary for the NRC experts to testify that the preponderance of the evidence suggests that Mr. Lantz provided incomplete and inaccurate information in a Quality Assurance record and to NRC investigators.

But, I have never sought a criminal case. For 5½ years (since uncovering this event in February 2007) all I have sought is an investigation - first from the company and then from the NRC. An investigation that seeks to understand the incident. That seeks to determine why the operators of a 3565 MWth reactor plant would, for nearly two hours, informally rely on Xenon-135 to keep the reactor from inadvertently restarting when there was nothing preventing the insertion of the control banks. After an internal investigation by Callaway Plant and three investigations by the NRC, I still do not have that answer.

Both Ameren and the NRC's response to this event can be summarized as "no harm, no foul". In every piece of correspondence the NRC generates regarding this event they make great pains to stress that, due to the buildup of Xenon-135, the public was not at any risk. Yet what the NRC fails to mention is that intentionally relying on Xenon-135 (without a formal calculation) to maintain the reactor subcritical is wholly unacceptable. And what the NRC also fails to mention is that, like me, they do not believe the operators INTENTIONALLY relied on Xenon-135; they believe that for at

least the first hour the operators were unaware of the status of the nuclear fission reaction. And, like me, they believe Mr. Lantz lied to them under oath. They fail to mention these things because they cannot objectively prove them; their proof lies in the "common sense" subjective analyses of their experts who have operated reactors.

Thus far the NRC has taken an indifferent bureaucratic approach to this issue. They have time and time again answered letters and closed investigations to the fact that, other than the failure to enter a Technical Specification which resulted in a non-cited violation, no NRC regulations were violated. It is not a violation of NRC regulations to:

- Intentionally allow a 3565 MWth commercial reactor plant to slowly passively shut itself down when active means to definitively drive the shutdown are available
- Informally rely on Xenon-135 to maintain the reactor subcritical while, for nearly two hours, the crew performs ancillary equipment alignments on the secondary and tertiary plants
- Maintain the reactor in the source range for 45 minutes with no Source Range Nuclear Instruments energized and with the control rods at their critical rod heights.

Bureaucratically hiding behind regulations is disingenuous since part of the NRC's mandate is to determine and write regulations. If the NRC finds holes in its own regulations - holes which allow gross violations of accepted reactivity management practices - then the NRC has an obligation to fix those holes.

The NRC licenses the operators at Callaway Plant and has a responsibility to ensure they are honest and competent. Admittedly, although Ameren's dishonesty is painfully evident, it is not easily proven. But their incompetence is easily shown. By their own statements, the Ameren operators have claimed that they thought it acceptable to allow the reactor to passively shut itself down and to rely on the passive buildup of Xenon-135 while they occupied themselves with performing ancillary duties. Can we ignore their statements? If untrue, they are lies told under oath to NRC inspectors investigating a significant incident. If true, they are an indication of gross incompetence with respect to accepted standards of reactor plant operations.

Roy Zimmerman has stated to me that "There is more to regulation than enforcement". In the spirit of that quote, I submitted a petition on September 17, 2010 requesting that the NRC issue a Demand for Information to Ameren regarding the 2008 testimonies of their operators to the Office of Investigation. At the request of Ameren, the Office of Nuclear Reactor Regulation closed that petition by bureaucratically claiming it had been looked into under Allegation RIV-2007-A-0096. However, it is not too late to submit a Demand for Information to Ameren. And it is not too late to perform a host of other "non-enforcement" regulatory actions (such as having Ameren testify before the Commission).

It is the utility, not the regulator, who operates the plant. It is the utility who employs the licensed operators. It is the utility who trains the licensed operators. As the emails enclosed with the attached document demonstrate, Ameren has, for whatever reasons, chosen not to discipline its operators for their careless disregard of accepted reactivity management practices.

On March 11, 2011 a tsunami hit Japan resulting in a chain of events damaging four nuclear reactor plants at Fukushima Dai-ichi owned by the Tokoyo Electric Power Company (TEPCO). Yet not all the plants hit by the tsunami were damaged. Onagawa Nuclear Power Plant, for example, was closer to the earthquake epicenter than Fukushima, yet survived intact due to an adequately designed tsunami wall.

Today, all 57 nuclear reactor plants in Japan are indefinitely shut down. Yet only 17 of these plants are owned by TEPCO and only 4 were damaged by the tsunami. The mismanagement of TEPCO has caused the demised of the entire Japanese nuclear enterprise - even the plants whose owners kept up with design changes required by changing information on the risks of natural disasters and latent design flaws.

We cannot allow the "no harm, no foul" attitude to prevent us from addressing the significant issues that exist at Ameren with regard to integrity and operator competency. If we ignore these issues at Ameren and the "foul" eventually does occur, it will jeopardize not just the public's confidence in Callaway Plant but in the entire US nuclear industry and possibly in our nuclear powered submarine and aircraft carrier fleets.

There is a reason nuclear power is regulated at the federal level. We cannot just be mere bureaucrats, accepting gross reactivity mismanagement as long as our incomplete regulations were not violated. We need to be regulators. We need

to find a way to ensure Ameren is operating its reactor plant competently and not concealing significant events from the regulator or the public. We need to ensure Ameren is making a good faith effort to address poor performance and not allowing a "good ole boy" network to protect individuals who do not have the talent and discipline to manage such a complex enterprise as nuclear power.

Region IV will claim that the October 21, 2003 has been investigated on multiple occasions. The intent of each of these investigations was merely to determine if a narrow reading of any NRC regulations had been violated. None of these investigations sought to:

- understand when the NRC licensed operators first became aware that the reactor was no longer critial
- understand why the NRC licensed operators would think it acceptable to informally rely on Xenon-135 to maintain the reactor subcritical when the control banks were available to be inserted
- understand why Ameren never did a root cause analysis of the event
- determine whether or not current NRC regulations are adequate to ensure future reactor shutdowns are more actively managed
- determine whether or not a broader reading of the NRC regulations had been violated (e.g. does intentionally allowing the reactor to passively shut down violate the NRC's requirement for procedure use and compliance since the Reactor Shutdown procedure was written with the assumption that the control banks would be used to actively shut down the reactor).

The NRC has yet to adequately investigate this event and still cannot answer the most basic questions about it: (1) when did the operators first become aware the reactor was no longer critical, (2) why did the operators informally rely on Xenon-135 to keep the reactor from inadvertently restarting, and (3) why did the operators not inform the utility's upper management that the reactor had passively shut down.

V/r,

Larry

Lawrence S. Criscione, PE
(573) 230-3959
"*Human experience shows that people, not organizations or management systems, get things done*."

August 15, 2012

1412 Dial Court
Springfield, IL 62704

Bill Borchardt
Executive Director for Operations
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: 10CFR2.206 Request Regarding Inaccurate and Incomplete Information Entered into a Quality Assurance Record at Callaway Plant

Dear Mr. Borchardt:

I am submitting the information contained below as a 10CFR2.206 request. The address above is my home address; however, my employment often keeps me away from home for weeks at a time. Please send all correspondence to me electronically at either my personal email account (LSCriscione@hotmail.com) or my work email. If you must send me a hard copy, please send it to me at Mail Stop CSB/C2 A7.

On October 21, 2003 an operating crew at Callaway Plant failed to recognize the reactor passively shut down while manually tripping the turbine in preparation for a forced shutdown. For over an hour the operators were unaware that the reactor was no longer critical. Once alerted to the status of the reactor (by a Main Control Board alarm which annunciates when a Source Range Nuclear Instrument energizes) the operators failed to take prompt action to conservatively place the reactor in a known safe condition. Instead, in order to conceal the inadvertent early shutdown from their superiors, for 40 minutes they recklessly informally relied on Xenon-135 to prevent the reactor from inadvertently restarting until the original time planned for the reactor shutdown was met.

The incident was never documented in the plant's Corrective Action Program until it was accidently uncovered in February 2007. On September 5, 2007 the Shift Manager during the incident (who holds a NRC issued Senior Reactor Operator license at Callaway Plant) intentionally entered inaccurate information into a Quality Assurance record in order to conceal his errors during the October 21, 2003 incident.

The October 21, 2003 passive reactor shutdown is the same incident which you personally discussed with the Chief Nuclear Officer of Ameren (Adam Heflin) when he came to your office on August 13, 2010 for a "Drop-in Visit". The primary topic of discussion at that meeting is listed in ML11363A113 as:

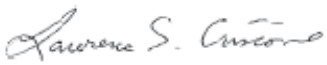
> *2003 Reactivity Management Event of Inadvertent Passive Shutdown; Exchange Perspectives; Confirm they are doing everything they can.*

This August 13, 2010 meeting was the meeting in which you reached an understanding with Ameren that:

> *Mr. Criscione's official NRC duties and responsibilities will not involve any matters with respect to Callaway.* [see page 5 of ML111030542]

I assume the above understanding with Ameren is the reason why you have not sought my perspective on the October 2003 event. Since I am not to be involved in addressing matters with respect to Callaway as part of my official NRC duties, please accept the remainder of this letter as a 10CFR2.206 Request submitted from me in my role as a concerned member of the public and as a licensed Professional Engineer in the State of Missouri who has public safety concerns regarding the practices of his former employer (Ameren). I do respectfully request though that, prior to delegating this petition to one of the offices, you read it in order to gain my perspective of the "*2003 Reactivity Management Event of Inadvertent Passive Shutdown*".

Very respectfully,



Lawrence S. Criscione, PE
(573) 230-3959

Enclosures (9)

Cc: Allison Macfarlane, Chairman, US Nuclear Regulatory Commission
Hubert Bell, Inspector General, US Nuclear Regulatory Commission
Jeanette Mott Oxford, Representative, Missouri House of Representatives
Kevin Gunn, Chairman, Missouri Public Service Commission
Lewis Mills, Public Counsel, Missouri Office of the Public Counsel

"*If responsibility is rightfully yours, no evasion, or ignorance or passing the blame can shift the burden to someone else.*"

10CFR2.206 Request Regarding Inaccurate and Incomplete Information Entered into a Quality Assurance Record at Callaway Plant

§1. Background

Callaway Plant is a nuclear reactor plant in Callaway County, Missouri which is operated by the St. Louis, MO based utility Ameren and was the location for the events which are the subject of this petition. See Table I of Enclosure 1 for an overview timeline of the event.

On October 21, 2003 a field piece of safety-related equipment was necessitating the plant to lower power in preparation for a possible forced reactor shutdown. Around 10:18 am the NRC licensed operators at the plant inadvertently allowed the reactor to passively shut down. The passive shutdown of the reactor went unnoticed by the operators and occurred during a time when the plant upper management was expecting the reactor to remain operating in the event that the forced shutdown could be avoided.

For over an hour, the operators were unaware of the status of the nuclear fission reaction until an alarm on the reactor's Main Control Board at 11:25 am alerted them to the fact that the reactor had shut down at some point in the past and was no longer producing fission power. At this point, widely accepted standards of operation dictated that the control banks should have been immediately inserted to ensure the nuclear fission reaction could not inadvertently restart. However, plant upper management was not expecting the reactor to be shut down until noon and inserting the control banks prior to noon would betray the fact that the operators inadvertently allowed the reactor to passively shut down.

From 11:25 am to 12:05 pm the operators relied on informal estimations that in the reactor core there were still sufficient levels of the radioactive waste gas Xenon-135 to absorb enough neutrons to prevent the reactor from inadvertently restarting.

At 12:05 pm the operators began insert the control banks. At this point no one outside the reactor's Main Control Room was aware that, instead of using the control banks to manually shut down the reactor, the control banks were instead being inserted into a reactor core which had passively shut down nearly two hours earlier.

Widely accepted standards of operation dictated that the inadvertent passive shutdown of the reactor should have been documented by the operators with a condition report in the plant's Corrective Action Program. No such report was ever written by the crew and as such through the 40 minute delay in inserting the control banks the incident was successfully concealed for 3½ years.

In February 2007 the atypical nature of the October 21, 2003 shutdown was noticed by an engineer (me) who was reviewing data from past reactor shutdowns in support of a revision to

the Reactor Shutdown procedure. For the first time the incident was documented in the plant's Corrective Action Program.

In August 2007 the Shift Manager during the event was assigned an action to answer eight questions regarding the incident, including "*Who on the Operating Crew recognized the reactor had shutdown?*" On September 5, 2007 in his answer to this question the Shift Manager claimed that he recognized the passive reactor shutdown as it occurred. This answer conflicts with the US Nuclear Regulatory Commission's November 2011 assessment of the event in which they stated "*…the NRC concluded that the operators were not aware of the shutdown.*" This conclusion by the NRC effectively amounts to a conclusion that on 2007-09-05 the Shift Manager entered inaccurate information into a Quality Assurance record.

The Quality Assurance record in question (Action 5 of Callaway Action Request 200702606) has not been the subject of any earlier NRC investigations.

§1.1. Failure of Inverter NN11 and Turbine Load Reduction

At 7:21 am on October 20, 2003, inverter NN11 failed at Callaway Plant, causing a safety related instrument bus to de-energize. This placed the plant in Technical Specification 3.8.7.A which allotted them 24 hours to repair the inverter and restore the bus. That is, at 7:21 am on 2003-10-20, the plant had 24 hours to either repair the inverter or begin the process of shutting down the reactor.

At 12:37 am on October 21, 2003, inverter NN11 had been repaired and was placed in service for retesting. The inverter failed its retest and at 1:00 am the operators began lowering turbine load in preparation for a forced reactor shutdown. Note that they did not need to begin lowering turbine load until 7:21 am, but in order to make the plant shutdown easier on their operators they prudently began lowering reactor power more than 6 hours ahead of schedule.

At 7:21 am on October 21, 2003 inverter NN11 was still not repaired. This placed the plant in Technical Specification 3.8.7.B which allotted them 6 hours to shut down the reactor. That is, at 7:21 am on 2003-10-21, the plant had 6 hours to either repair the inverter or complete the process of shutting down the reactor.

Procedurally, the reactor at Callaway Plant could not be considered shutdown until a Shutdown Margin calculation was satisfactorily performed. This calculation could take upwards of an hour to perform, so it would not be prudent of the plant to wait until 1:21 pm (i.e. the six hour limit) to shut the reactor down. Just as a decision was made to begin the down power over 6 hours early to avoid rushing the operators, a similar decision was made to complete the shutdown over an hour early. That is, a decision was made to shut the reactor down at noon if the repairs to inverter NN11 were not progressing.

At 8:21 am inverter NN11 was again thought to be repaired and was restored to service for retesting. The inverter again failed its retest. See Table II of Enclosure 1.

§1.2. Attempt to Stabilize Power at Nominally 10% Rated Reactor Power

At 9:30 am the reactor was at nominally 10% rated reactor power and the electricians were still in the process of attempting to repair inverter NN11. Since the down power was, at this time, about 2 hours ahead of schedule, the operators decided to hold reactor power around 10% in order to give the electricians more time to repair the inverter. From 10% power it should take roughly 30 minutes to complete the reactor shutdown by manually tripping the turbine and inserting the control banks into the reactor core.

At 9:36 am and 9% rated reactor power, the operators quit lowering load on the turbine-generator in order to stabilize reactor power. However, the operators failed to account for the buildup of the radioactive waste gas Xenon-135. When turbine power was held steady at 9% rated steam demand, the buildup of Xenon-135 caused reactor power to continue to decrease until it stabilized at 8% rated reactor power. With a 1% power mismatch between reactor power and turbine power, the excess energy needed to meet steam demand came from a lowering of the bulk enthalpy of the reactor coolant, which resulted in a 22°F/hr drop in average reactor coolant temperature. This lowering in reactor coolant temperature caused an insertion of positive reactivity which matched the insertion of negative reactivity caused by the continual buildup of Xenon-135. See Enclosure 1, Figure 1 and Table III.

The operators failed to recognize what was occurring and blamed the uncontrolled temperature drop on some recently opened turbine drain valves. Some apparently faulty indication lights associated with the turbine drains prompted the reactor operators in the Main Control Room to coordinate troubleshooting efforts with the equipment operators out in the plant in order to regain control of average reactor coolant temperature.

After falling 9°F in less than 25 minutes, by 10:00 am the average reactor coolant temperature was below the plant's regulatory Minimum Temperature for Critical Operations (MTCO). This apparently went unnoticed by the operators in that they never logged it and failed to enter the appropriate Technical Specification (3.4.2).

The lowering in reactor coolant specific volume which accompanied the temperature drop caused the reactor coolant's expansion volume in the pressurizer to lower. This lowering of pressurize level mimicked a reactor coolant leak and caused the plant's letdown system to automatically isolate at 10:00 am.

With the misguided turbine drain valve troubleshooting efforts not producing any results and with average reactor coolant temperature continuing to uncontrollably lower, the Shift Manager decided to manually trip the main turbine to assist in stemming the temperature drop.

§1.3. Manual Turbine Trip and Passive Reactor Shutdown

Between 10:03 and 10:12 am, turbine load was lowered from 9% to 6% of rated load. At 10:13 am the NRC licensed operators manually tripped the turbine-generator. With reactor power momentarily still at 6% rated power immediately following the turbine trip and with no steam demand to remove this power, average reactor coolant temperature rapidly rose. The negative reactivity inserted by this rapid rise in reactor coolant temperature caused the reactor to passively shut down. See Enclosure 1, Figure 3.

During this time, the control room operators were distracted by the continued troubleshooting efforts with the turbine drain valves and with restoring the letdown system. Amidst these distractions the operators failed to notice the reactor passively shutting down. By 10:18 am the nuclear fission reaction had reached the point at which it could no longer be conservatively restored without completing the shutdown and performing the Reactor Startup Procedure. The only prudent course of action at this point was to manually insert the control banks.

However, the operators would not commence inserting the control banks for another 107 minutes (until 12:05 pm). It is the assessment of the NRC that for at least the first 67 minutes of these 107 minutes (i.e. from 10:18 to 11:25 am), the control banks were not inserted because the operators were not aware the reactor had passively shut down (see item 3 of the enclosure to ML113220478). This assessment directly contradicts the claims of David Lantz, the Shift Manager during the incident. In Action 5 of CAR 200702606 (a Quality Assurance record) and during his April 1, 2008 interview by the Office of Investigation (which was rendered under oath), Dave Lantz claimed that prior to giving the order to manually trip the turbine he was aware that such action would cause the reactor to passively shut down.

Mr. Lantz claims that he cognizantly allowed the reactor to passively shut down and that he cognizantly relied on Xenon-135 to maintain it subcritical while his crew re-aligned secondary and tertiary plant equipment. If true, these claims amount to an astounding disregard for the principles of conservative reactor plant operation and indicate a level of gross incompetence which cannot be ignored. The primary duty of NRC licensed operators is to actively control the nuclear fission reaction in the reactor core. To informally rely on a radioactive waste gas to keep the reactor from inadvertently restarting is wholly unacceptable and, if Mr. Lantz's claims are true, they indicate a severe gap in the operator initial licensing process within NRC Region IV and the training accreditation process delegated to the Institute of Nuclear Power Operations (INPO).

§1.4. Transit of Reactor Power into the Source Range

At 10:18 am the operators restored a 75 gpm letdown orifice to service and exited the off-normal procedure for "Loss of Letdown". Instead of assigning the Reactor Operator the task of manually inserting the control banks (a task which takes 10 minutes), the Control Room Supervisor directed the Reactor Operator to place an additional 45 gpm letdown orifice in service using the normal operating procedure.

From 10:18 to 10:23 am, fission power lowered to the Point of Adding Heat (POAH). See Enclosure 1, Figures 2, 3 and 4 and Table IV.

Once fission power was below the Point of Adding Heat, total power stabled out at approximately 2% rated reactor power as indicated by the primary calorimetric instrumentation (i.e. the core ΔT meters). Due to the emission of gamma rays from the radioactive waste inventory in the core, the Power Range Nuclear Instruments (PRNIs) indicated about 1% power. The secondary calorimetric computer point indicated a megawatt thermal reading consistent with 1.75% rated reactor power. Thus, except for the Intermediate Range Nuclear Instruments (IRNIs) all Main Control Board indications showed a stable reactor power of about 2%. The operators mistook these indications as indication that the reactor was still critical and producing 2% fission power.

From 10:23 to 10:39 am reactor power lowered from the Point of Adding Heat into the source range. It is the assessment of NRC Region IV that during this time frame the operators were unaware the reactor was no longer critical (see item 3 of the Enclosure of ML113220478). This assessment is based on the following observations:

1.4.1. As reactor power lowered four decades, no action was taken to actively drive the reactor shutdown. The control rods were fully functional yet no action was taken to insert them. The boron system was operational yet no action was taken to raise boron concentration. The control rods were left at their critical rod heights and the buildup of Xenon-135 was passively relied upon to keep the reactor from restarting.

1.4.2. No formal calculation of Shutdown Margin was completed during this time frame and thus the passive reliance upon Xenon-135 appears to have been unintentional.

1.4.3. During this time frame a NRC licensed Reactor Operator was assigned the task of placing the blow down system for the cooling tower into service. It is unlikely the Shift Manager and Control Room Supervisor (i.e. the Senior Reactor Operators) would have prioritized this activity over inserting the control banks had they been aware the reactor was no longer critical and transiting to the source range with the control rods at their critical rod heights.

1.4.4. During this time frame a NRC licensed Reactor Operator was assigned the task of taking an intake pump out of service. It is unlikely the Senior Reactor Operators (SROs) would have prioritized this activity over inserting the control banks.

1.4.5. During this time frame the Reactor Operator was continuing the task of placing an additional letdown orifice in service to increase letdown flow from the adequate flow rate of 75 gpm to the optimal flow rate of 120 gpm. It is unlikely the SROs (David Lantz and Gerry Rauch) would have prioritized this activity over inserting the control banks.

Region IV's assessment that the operators were unaware reactor power was transiting to the source range directly contradicts the claims made by the Shift Manager (Dave Lantz) in his response to Action 5 of Callaway Action Request 200702606 (which is a Quality Assurance record). In his 2007-09-05 response, Dave Lantz claims that the 10:18 am passive shutdown of the reactor was not inadvertent and that he was aware that the reactor was no longer critical as power lowered into the source range:

> "*Again I would state the reactor was NOT inadvertently shutdown. The plant was in a 6 hour action to be in Mode 3 due to a failure of NN11 inverter. When I directed a manual turbine trip low in Mode 1 in response to an RCS temperature transient, I was aware that the loss of turbine load, subsequent RCS heatup, and the continual buildup of Xenon from the down power would result in the reactor going subcritical. My intent was to continue with the plant shutdown and reactor shutdown. There was never any intent to stay in Mode 1 or Mode 2.*"

§1.5. Operation in the Source Range with no SRNIs

As reactor power entered the source range at 10:39 am, there was substantially more subcritical multiplication than normally present due to the control banks still being at their critical rod heights. This abnormally large amount of subcritical multiplication delayed the automatic energizing of the Source Range Nuclear Instruments (SRNIs).

The Intermediate Range Nuclear Instruments (IRNIs) at Callaway Plant contain several bistables which drive permissive circuitries that affect the SRNIs. One permissive is P-10 which actuates around a power level of 10% rated reactor power. One of the functions which occurs along with this permissive is the automatic de-energizing of the Source Range Nuclear Instruments. When P-10 resets (i.e. is no longer lit), then the SRNIs can be manually energized.

Another permissive driven by the IRNIs is P-6. Permissive P-6 typically sets at 1E-10 ion chamber amps (ica) and resets at 5E-11 ica. One of the functions of P-6 is to allow the manual de-energizing of the SRNIs. That is, above 1E-10 the SRNIs can be manually de-energized. When P-6 is not present (e.g. when IRNI currents are less than 5E-11 ica), the SRNIs cannot be manually de-energized. If an SRNI is de-energized when P-6 resets, then it will automatically energize.

With the control banks inserted, IRNI currents are typically less than 5E-11 ica when the reactor enters the source range. However, on October 21, 2003 the reactor entered the source range with its control banks still at their critical rod heights. The excess reactivity afforded by the withdrawn control banks caused IRNI currents to be about half a decade higher than normal (i.e. around 1E-10 ica as opposed to a normal reading of 5E-11 ica). It took over 45 minutes for Xenon-135 levels to buildup to the point where they lowered subcritical multiplication enough to allow the SRNIs to automatically energize.

Although the Callaway Plant Technical Specifications do not require the SRNIs to be operable until P-6 is reset, the Westinghouse designers of the reactor plant never intended for the reactor to be operated in the source range with no SRNIs energized and with the control rods still at their critical rod heights.

The Source Range Nuclear Instruments provide a substantial amount of "Defense-in-Depth" against an uncontrolled criticality caused by an inadvertent cooldown or dilution:

1.5.1. A high flux trip which is set 5 decades below (i.e. 100,000 times more sensitive) than the high flux trips on the Intermediate Range Nuclear Instruments.

1.5.2. A "flux doubling" circuitry which detects a 70% rise in neutron count rate during a rolling 10 minute period. This circuitry protects against unplanned reactivity additions (e.g. inadvertent dilutions, inadvertent cooldowns) by activating the Boron Dilution and Mitigation System (BDMS) which automatically swaps the suction of the charging pumps from the Volume Control Tank to the highly borated Refueling Water Storage Tank.

1.5.3. An audible indication of neutron count rate which can quickly alert the operators to unexpectedly rising reactor power levels.

1.5.4. A meter indication which encompasses the entire breadth of the source range as compared to the Intermediate Range Nuclear Instruments which are restricted to their last two decades while in the source range.

1.5.5. An indication of reactor startup rate (SUR) designed for detecting lowering reactor periods in the source range.

Although the SRNIs were available between 10:39 and 11:25 am, the operators never manually energized them. During this time frame, the Reactor Operator continued with the evolution of placing the 45 gpm letdown orifice in service. Also during this time frame a licensed reactor operators was assigned to assist in removing a condensate pump from service and Instrumentation and Controls (I&C) technicians were assigned to perform trip point and calibration checks on some of the Power Range Nuclear Instruments (PRNIs).

Note that these non-emergent activities were being done with the reactor in the source range and with (1) no SRNIs energized, (2) no formal calculation completed to show Xenon-135 levels were sufficient to protect against credible dilution and cooldown events, and (3) the control rods still at their critical rod heights. Region IV believes that the performance of these activities are further indication that, prior to the first SRNI automatically energizing, the control room operators were unaware the reactor had become subcritical and entered the source range.

§1.6. Source Range Nuclear Instruments Energize

Callaway Plant stores plant computer data on a system which they refer to as "eDNA". eDNA data for the channel 2 Source Range Nuclear Instrument indicates that on October 21, 2003 it automatically energized at 11:25 am with an initial reading of 3044 counts per second (cps). The channel 1 SRNI energized at 11:38 am with an initial reading of 2593 cps. The time used by Region IV for marking the energizing of the SRNIs is 11:34 am. This time is merely the time that the Reactor Operator logged the event. It apparently took 9 minutes after the first SRNI energized for the Reactor Operator to recognize that the reactor really was in the source range. The 11:34 am log entry curiously comes after an 11:42 am log entry which suggests it may have taken 17 minutes (or 4 minutes after the second SRNI energized) for the operators to realize they were really in the source range.

As mentioned above, when P-10 is reset (at around 10% rated reactor power) the operators are able to manually energize the SRNIs. Concurrent with P-10 resetting, the Main Control Board (MCB) alarm window 77E, SR HI VOLT FAIL, annunciates. This alarm window indicates that the SRNIs are within a range in which they can be energized but do not have power applied to them.

When power is restored to a SRNI (i.e. when it is either manually or automatically energized), alarm window 77E clears. When this alarm clears, it flashes on the Main Control Board and audibly annunciates. Therefore, when the channel 2 SRNI automatically energized at 11:25 am, the operators were alerted to it by the annunciation and flashing of MCB alarm window 77E. Regardless of whether or not the operators were aware of the status of the reactor prior to 11:25 am, once alarm window 77E annunciated everyone (i.e. NRC Region IV, Callaway Plant, and myself) agrees that the operators soon became aware that the reactor was shutdown and in the source range.

§1.7. Informally relying on Xenon-135 for Shutdown Margin

From 11:25 am onward, the operators were aware the reactor was in the source range yet still took 40 minutes to begin inserting the control banks.

At Callaway Plant there is a formal procedure (OSP-SM-00001) for conducting a Shutdown Margin calculation. This procedure does allow Xenon-135 levels to be credited towards Shutdown Margin, but during all calculation methods for Modes 3 through 5, the control bank rods are assumed to be fully inserted with the exception of one stuck rod. From 11:25 am to 12:05 pm the control bank rods were still at their last critical rod heights and the operators were consciously relying on Xenon-135 to keep the reactor from inadvertently restarting. They were doing this without any formal calculation in place to show that Xenon-135 levels were sufficient to protect against an inadvertent cooldown or inadvertent dilution.

The Shift Manager's version of events can be found in his September 5, 2007 response to Action 5 of CAR 200702606 and in his April 1, 2008 testimony to the NRC's Office of Investigations. His version of events essentially amounts to:

- From 10:13 to 10:18 am he consciously allowed the reactor to passively shut down and prioritized restoring the letdown system over actively driving the reactor shutdown.
- From 10:18 to 12:05 pm he informally relied on Xenon-135 to maintain the reactor shutdown while his crew aligned equipment in the secondary and tertiary plants.

Although the NRC permits its licensees to operate in such a manner, generally accepted practices within the industry are for operators to always actively control the nuclear fission reaction and to never informally rely on passive plant conditions to keep the reactor from restarting.

During the 40 minutes (from 11:25 am to 12:05 pm) that the crew was aware the reactor was in the source range with its control rods still at their last critical rod heights, NRC licensed reactor operators prioritized the following tasks over inserting the control banks:

1.7.1. Aligning the ventilation system for a mini-purge of containment to support a containment entry later in the day.

1.7.2. Placing the Motor Driven Feed Pump in service and securing the last Turbine Driven Main Feed Pump in order to more easily maintain primary plant temperature later in the day as decay heat load lowered.

1.7.3. Performing the close-out of off-normal procedure OTO-NN-00001, *Loss of Safety Related Inverter*, which had been open since 08:21 am and which had been set aside for over 3 hours due to higher priority tasks (e.g. aligning the steam plant for shutdown operations). Although the operators had allowed the shutdown of the steam plant to take priority over this off-normal procedure, they later claimed that this off-normal procedure took priority over the shutdown of the reactor plant and was "*the biggest delay*" preventing them "*from going on with the reactor shutdown procedure*".[1]

Thus far, the NRC has declined to investigate why operators whom they license would make such reckless choices with regard to managing core reactivity.

§1.8. Inserting the Control Banks

At 12:05 pm the operators began manually inserting the control banks. It took 10 minutes to insert all four banks. It is not understood why it took 107 minutes (i.e. from 10:18 am – the time reactor power could not be prudently recovered – to 12:05 pm) to begin inserting the

[1] Page 18, lines 1-3 of David Lantz's April 1, 2008 testimony to NRC OI

control banks, considering that the evolution only takes one reactor operator 10 minutes to perform whereas there were multiple examples of lower priority activities (e.g. aligning the ventilation system for a containment mini-purge or swapping from a turbine driven feed pump to a motor driven feed pump) occurring which take much more than 10 minutes' time of a licensed reactor operator.

When the operators began inserting the control banks at 12:05 pm, no one outside of the Main Control Room was aware that, instead of using the control banks to manually shut down the reactor, the control banks were merely being inserted into a reactor core which had passively shut down nearly two hours earlier.

At 11:42 am the Shift Technical Advisor began a Shutdown Margin calculation (SDM). At 12:55 pm, the SDM was completed and the crew spent the next 90 minutes adding over 3600 gallons of boron to the reactor coolant system.

§1.9. CAR 200701278

In early February 2007, I was asked by J.R. Scherr (a retired Reactor Operator who was back at Callaway Plant as a contractor preparing a major revision to the Reactor Shutdown procedure) to review some past reactor shutdowns in order to determine a good power level from which to manually trip the reactor. I was able to retrieve useable data from nine reactor shutdowns, one of which was the October 21, 2003 passive reactor shutdown and another of which was the June 17, 2005 passive reactor shutdown.

The June 17, 2005 passive reactor shutdown was very similar to the October 21, 2003 passive shutdown with the exception that on June 17, 2005 the operators attempted to raise reactor power/temperature twelve minutes after the passive shutdown and soon recognized that the reactor had inadvertently shut down (see Figures 5-7 of Enclosure 1). Just like on October 21, 2003, the operators failed to document the event.

I originated Callaway Action Request (CAR) 200701278, *Analysis of Past Reactor Shutdowns – RF15 Preparation Concerns*, on Saturday, February 10, 2007 to document my findings. CAR 200701278 was screened on Tuesday, February 13th (see Enclosure 2).

I attended the screening meeting and lobbied for CAR 200701278 to be assigned a significance level of 1 or 2, meaning that it required a root cause analysis. It was my position that a root cause analysis needed to be performed to determine why it took 107 minutes to insert the control rods on October 21, 2003 and why the inadvertent passive shutdown of the reactor had not been documented in the Corrective Action Program. The Operations Department representative at the Screening Committee meeting (George Belchik) successfully argued that since the event occurred nearly 3½ years in the past there was no point in investigating it. The screeners assigned CAR 200701278 a significance level of 4, meaning that it needed no evaluation and could be closed as soon as corrective actions were assigned. I disputed this assessment and over the course of the next two weeks brought the issue up my chain of

command. After a February 22, 2007 meeting with the Site Vice President (Adam Heflin) failed to raise the significance level (see page 16 of Enclosure 3), I decided to take my concerns to the US NRC.

§1.10. RIV-2007-A-0028

In a March 1, 2007 letter to the NRC Senior Resident Inspector at Callaway Plant (Michael Peck), I presented my concerns regarding the October 21, 2003 passive reactor shutdown. At the time, my primary concerns were:

1.10.1. The control rods were left withdrawn for 40 minutes (from 11:25 am to 12:05 pm) in order to conceal the passive reactor shutdown from the plant's upper management. Note that the plant's upper management were expecting the reactor to be shut down around noon, so that by delaying until after noon to insert the control banks the operators were able to give the impression that they were using the control banks to shut down the reactor and were thus able to conceal the fact that the reactor had inadvertently passively shut down nearly two hours earlier. Had the control banks been inserted at 11:25 am, the operators would have had to explain to their management why they were shutting the reactor down early and thus would have had to admit that they inadvertently allowed the reactor to passively shut down following the turbine trip and had failed to recognize it for over an hour.

1.10.2. The event was never documented in the Corrective Action Program in 2003 because the operators wished to cover it up.

1.10.3. The utility was intentionally downplaying CAR 200701278 in 2007 because admitting to the October 21, 2003 passive shutdown was potentially embarrassing to the utility.

Region IV processed my March 1, 2007 letter as Allegation RIV-2007-A-0028 and assigned it to their Resident Inspector at Callaway Plant (David Dumbacher) to investigate. Dave Dumbacher never spoke to me during his investigation and apparently never sought to understand why reactor operators – whom his region licenses – would have taken 107 minutes to insert the control banks following the passive shutdown of the reactor. Mr. Dumbacher merely sought to determine if any NRC regulations were violated. The only violation which he found was that the operators failed to enter Technical Specification 3.4.2 when the reactor dropped below the Minimum Temperature for Critical Operations. It was determined that none of the following were in violation of any NRC requirements:

- Failing to notice a 3565 MWth commercial reactor passively shut down and transition into the source range until, after 67 minutes, being alerted by a Main Control Board annunciator.

- Allowing a 3565 MWth commercial reactor to operate in the source range for 45 minutes with its control rods at their last critical rod heights and with no Source Range Nuclear Instruments energized.
- Informally relying on Xenon-135 for 40 minutes to keep a 3565 MWth commercial reactor from inadvertently restarting while ancillary equipment is aligned for convenience.

Allegation RIV-2007-A-0028 was closed in August 2007 and thus had nothing to do with the investigation of the September 5, 2007 entry into Quality Assurance record CAR 200702606 Action 5.

§1.11. Email to Chief Nuclear Officer and Chief Executive Officer

During May 2007 Callaway Plant was at the beginning of fuel cycle 16 and was experiencing a leak from the electro-hydraulic control (EHC) system which operators the controls on its turbine-generator. On May 24, 2007 Browns Ferry Unit 1 had experienced a similar leak which resulted in an EHC rupture and turbine/reactor trip during its first startup following a 20 year outage. On the mid-watch of May 30, 2007 I was the Shift Technical Advisor in the Callaway Plant Main Control Room. On that watch, the Shift Manager (Fred Bianco) had a discussion with his operating crew regarding the Browns Ferry EHC rupture and the current EHC leak at Callaway Plant.

During the discussion, Fred stated that he had asked Engineering to develop a point at which they considered the leak bad enough to require the plant to be shut down (i.e. to provide a number of drops per minute at which the EHC oil leak rate was considered bad enough to necessitate immediate repair). The point of the crew discussion was how to conduct the shutdown were the leak rate to escalate.

The Reactor Operator (Jim Keyes) was under the impression that were a rapid down power required (i.e. 30%/hour decrease in turbine loading) then Xenon-135 levels would be too great to be able to keep the reactor critical. I disagreed with his assessment.

I performed a Xenon-Prediction and I discussed it with Jim Keyes. I also showed him CAR 200701278 and discussed that with him as well. Jim was unaware of CAR 200701278 up until that point. We discussed a possible strategy for maintaining the reactor critical during the EHC repairs following a rapid downpower. One of the main points of CAR 200701278 was to ensure that a discussion such as mine and Jim's did not need to occur. That is, CAR 200701278 requested that guidance be added to the Reactor Shutdown procedure for holding the reactor critical following a rapid downpower. After three months, no efforts had been made towards providing this guidance to the operators – despite the efforts I had consistently made addressing the issue with my chain of command.

Following our discussion, I sent an email to the Chief Nuclear Officer (Charles Naslund) which was copied to the Chief Executive Officer (Tom Voss) as well as to other members of my chain

of command and concerned operators (see pp. 28-29 of Enclosure 3). In the email I informed Chuck Naslund of my concerns that the plant was not adequately addressing CAR 200701278.

Following my email to Mr. Naslund, I had a meeting with my immediate supervisor (Jim Milligan) and his supervisor (JR Weekley). At this meeting, I was informed that my email to the Chief Nuclear Office was degrading and not factual. There was, in fact, a factual error in my email which I corrected with a June 1, 2007 email to Fadi Diya, the Plant Director (see pp. 27-28 of Enclosure 3).

Following my June 1, 2007 email to Mr. Diya, I was placed on a Performance Improvement Plan (PIP) which contained the following items:

- Keep department leadership informed of issues.
- Do not degrade peers verbally or in written communications.
- Support the CAR Screening team. (NON-CONFRONTATIONAL)
- Utilize accurate verbal and written communications.
- Utilize accurate factual information during CAR development.
- Utilize non-confrontational terminology in verbal and written communications.

There are some who would view my May 30, 2007 email to the Chief Nuclear Officer as confrontational and inappropriate. However, there are others (e.g. me) who believe that there are times when the public expects a Professional Engineer to be willing to be confrontational to address a safety concern which is being ignored. Low Power operations at commercial nuclear power plants are infrequent evolutions and have often led to noteworthy operator errors with regard to reactivity control (e.g. Chernobyl in 1986, Big Rock Point in 1991, Grand Gulf in 1991, Monticello in 1991, Zion in 1997, Surry in 2005, Cruas in 2006)[2]. In February 2007 I had personally analyzed two significant incidents at Callaway Plant (the 2003-10-21 and 2005-06-17 passive reactor shutdowns) and recognized that a major liability in Callaway Plant's performance of low power operations was that there existed no guidance for holding the reactor critical at low powers.

At the time of my 2007-05-30 email, the Reactor Shutdown procedure at Callaway Plant assumed that all the operators needed to do to hold the reactor at low power was to merely delay performing the remaining steps of the procedure. In late May 2007 there was serious discussion about remaining critical while repairs were done to the turbine EHC system. I was not opposed to this, but I was concerned that after 3 months the necessary changes to support this type of activity had not yet been made to the procedure – despite personal discussions with all members of my chain of command including the Site Vice President. In light of these

[2] Other than the 1986 reactivity management errors at Chernobyl which led to a significant nuclear accident, the events listed here are known to the industry because they were reported by the respective utilities. It is not known how many noteworthy incidents (such as the 2003 and 2005 unnoticed passive reactor shutdowns at Callaway Plant) have gone unreported, but the accepted standard in the nuclear industry is that such incidents are internally analyzed with the results externally shared.

concerns and the failure of the organization to address them, I believed that raising the issue to the Chief Nuclear Officer and Chief Executive Officer was appropriate on May 30, 2007.

Unbeknownst to me at the time of my May 30, 2007 email, the Operations Manager (David Neterer) had been doing an observation in the Main Control Room at 11:25 am on October 21, 2003 when the channel 2 SRNI energized and the crew first became aware of that the reactor had passively shut down over an hour earlier.[3] Dave Neterer was thus complicit in concealing the event from the utility's upper management in 2003, and thus in 2007 he had a vested interest in preventing the October 21, 2003 passive shutdown from being investigated. The Performance Improvement Plan I was placed on following my May 30, 2007 email was merely an attempt by the Operations Manager at Callaway Plant to discourage me from further pursuit of answers to the October 21, 2003 passive reactor shutdown.

§1.12. CAR 200702606

On the afternoon of March 19, 2007 the Reactivity Management Review Committee (RMRC) meeting met in the conference room by my cubicle for their March meeting. I interrupted the meeting and requested to be added to their agenda to present CAR 200701278. I was allotted time at the end of the meeting to present CAR 200701278 to the RMRC. The Shift Manager in attendance at this meeting was Gary Olmstead. Until my presentation on 2007-03-19, Mr. Olmstead had been unaware of the passive reactor shutdown that had occurred on 2003-10-21. Following the meeting, Mr. Olmstead wrote a condition report (CAR 200702606) to have the incident investigated (see Enclosure 4).

On August 15, 2007 I was assigned the Lead of CAR 200702606 and told by my supervisor to get it closed. On Friday, August 24, 2007 I drafted an action (originally Action 4 of CAR 200702606) which asked eight questions concerning the 2003-10-21 passive shutdown. My intent was to send Action 4 to David Lantz (the Shift Manager on duty for the 2003-10-21 shutdown). However, prior to sending the action I requested of several concerned individuals that they review it (see Enclosure 5). I copied the action from CAR 200702606 Action 4 and pasted it in an email which I sent to Gary Olmstead (the originator of CAR 200702606), Jim McInvale (the Supervisor of Reactor Engineering) and David Hopkins (an Operations Trainer considered to be the Subject Matter Expert for Reactivity Management).

On Monday, August 27, 2007 I was working in the Main Control Room as the Shift Technical Advisor. At 6:59 am my supervisor (James Milligan) transferred the Lead of CAR 200702606 from me to him. This was done without consulting me. He then deleted Action 4 (the action containing the 8 questions). At the time, Action 4 was still in "Initiate" so it could be deleted without any record of its existence (other than my August 24, 2007 email). At 10:24 am Jim

[3] In 2003, Callaway Plant had a database for tracking management observations. In 2007 this database still had a record in it of a management observation performed in the Main Control Room by David Neterer of the reactor shutdown on 2003-10-21. To my knowledge, there are no retention requirements for this database, but in my vacant duplex in Missouri I still have a hardcopy record from the database.

Milligan took CAR 200702606 to "PendingClose" which resulted in an automatic action being generated for a Management Closure Review (which became Action 4 since my earlier Action 4 had been deleted). JR Weekley performed the Management Closure Review and CAR 200702606 was closed at 11:41 am (see page 5 of Enclosure 4).

At 11:57 am I received an email from Gary Olmstead stating that my 8 questions in Action 4 looked acceptable to him (see Enclosure 5). When I went to send Action 4 of CAR 200702606, I became aware that earlier in the morning Action 4 had been deleted and CAR 200702606 had been closed. At the time, I was one of the few people in the Operations Department who had access rights to re-open a closed condition report. I re-opened CAR 200702606 and sent out my 8 questions as Action 5, assigning it to Dave Lantz (the Shift Manager for the 2003-10-21 shutdown) to address.

The following day (Tuesday, 2007-08-28) I had a hostile meeting with my supervisors (Jim Milligan and JR Weekley) regarding the re-opening of CAR 200702606 and the assignment of Action 5 (see pp. 4-9 or Enclosure 6). At this meeting, I was told that the substance of the questions I posed to David Lantz were "degrading". Note that the meeting minutes provided in Enclosure 6 were scrubbed by the company (the original notes were handwritten and never provided to me) and were not provided to me until 7 weeks later. My version of the meeting was immediately sent via email to the company to review and they provided no dissension to it (see page 4 of Enclosure 6).

In my opinion, a Professional Engineer needs to be free to question the integrity of another professional. There have been countless examples in our society where individuals in professions held in the highest esteem (e.g. Catholic priests, Wall Street investment bankers, physicians) have been found to not live up to their professional expectations. Although I believe that in general the overwhelming majority of NRC licensed Senior Reactor Operators are honest individuals, from my experience as an adult I realize that even in the most esteemed professions there will occasionally be outliers who are willing to dishonestly conceal their mistakes. By accusing me of "degrading" David Lantz for asking him to explain the nearly two hour delay in inserting the control rods on 2003-10-21, Callaway Plant was creating an environment which prevented the investigation of a serious breach in accepted reactor plant operations.

On August 29, 2007 I was accused of changing the due date of CAR 200702606 without permission from the Site Vice President (see Enclosure 7). Although this was technically correct (I had changed the due date in the electronic system) it was really a trumped up charge. Prior to closing CAR 200702606 on 2007-08-27 my supervisor had changed the due date from October 17, 2007 to September 3, 2007. When I re-opened CAR 200702606 I restored the due date to October 17, 2007 in order to allow Dave Lantz sufficient time to answer his action.

On September 5, 2007 David Lantz submitted his answers to the 8 questions (see pp. 7-8 of Enclosure 4). Some of his answers contain inaccurate and misleading information. Since Action 5 of CAR 200702606 is a Quality Assurance record, I would like the NRC to review Mr. Lantz's

answers and assess whether or not he violated any NRC regulations (see Section §2 of this petition).

In addition to myself, Callaway Shift Manager Gary Olmstead was involved in attempting to get the October 21, 2003 passive reactor shutdown investigated (Mr. Olmstead had been the Shift Manager in attendance at the March 2007 Reactivity Management Review Committee meeting and had originated CAR 200702606 following that meeting). Mr. Olmstead's ordeal can be found in his sworn testimony to the Office of Investigations on May 7, 2009 (available under NRC FOIA/PA request 2010-0338).

§1.13. OI 4-2007-049

On April 1, 2008 David Lantz was interviewed under oath by Crystal Holland of the US NRC Office of Investigations (OI). The NRC technical assistant for that interview was Jeremy Groom, the Resident Inspector at Callaway Plant. I believe that Ms. Holland and Mr. Groom were not adequately prepared for this interview and as a result failed to follow through on "holes" in Dave Lantz's version of events. These concerns were submitted to the NRC in a petition dated September 17, 2010 (ML103280306) which the NRC rejected in a January 19, 2011 response (ML110140104). Please note that this current petition is completely separate from the September 17, 2010 petition. The September 17, 2010 petition addressed misleading statements made during sworn testimony and did not make any reference to the September 5, 2007 entry into a Quality Assurance record at Callaway Plant.

CAR 200702606 was provided to Crystal Holland on November 6, 2007 and she was informed of my concerns regarding Dave Lantz's statements in Action 5. However, for reasons unbeknownst to me she did not include CAR 200702606 as part of her investigation. The OI report of Case 4-2007-049 makes no mention of CAR 200702606 and CAR 200702606 is not listed as an Exhibit in that report. Furthermore, there is no mention of CAR 200702606 in any of the March 31 or April 1, 2008 interviews which were conducted at Callaway Plant. In summary, the entry of inaccurate information into Quality Assurance record CAR 200702606 Action 5 was not part of the investigation conducted under OI 4-2007-049.

§1.14. RIV-2007-A-0096

In an August 15, 2007 letter to one of my US Senators (Richard Durbin, Illinois), I informed him that I was concerned about the way the NRC had handled Allegation RIV-2007-A-0028. I provided a copy of this letter to Dave Dumbacher (the Senior Resident Inspector at Callaway Plant) who forwarded it along to his superiors at NRC Region IV. My letter resulted in the opening of Allegation RIV-2007-A-0096.

Allegation RIV-2007-A-0096 was conducted by the same office (i.e. Region IV) which had conducted RIV-2007-A-0028. As with its earlier investigation, there was no attempt to understand what occurred on October 21, 2003 that resulted in the control rods being left withdrawn for 107 minutes following the passive reactor shutdown. During the interview of

the crew members, the NRC did not challenge the statements given to them. For example, the NRC accepted the 10:34 am control room log entries (i.e. securing an intake pump and placing cooling tower blowdown in service) as indication that the crew was busy performing plant shutdown related activities. A more "investigative" approach would have been to recognize that the 10:34 am activities were evidence that the crew was NOT busy – that is, if they could spare two reactor operators to restore cooling tower blowdown and secure an intake pump then they surely had the resources available to manually insert the control banks.

Allegation RIV-2007-A-0096 was conducted with one purpose: to validate the findings of Allegation RIV-2007-A-0028. After the completion of RIV-2007-A-0096 the NRC could still not answer basic questions regarding the event:

1.14.1. When did the operators first become aware the reactor was subcritical and in the source range?

1.14.2. Why would a Senior Reactor Operator licensed by Region IV cognizantly allow a large commercial reactor to passively shut down when he had the means available (i.e. control rods and boron) to actively drive the shutdown? Why would he informally rely on Xenon-135 to prevent the reactor from restarting when he had reactor operators available to do ancillary tasks such as raise letdown flow from 75 to 120 gpm, remove an intake pump from service and restore the blowdown system at the cooling tower? Were these indications that he did not realize the reactor had passively shut down?

1.14.3. Why did SROs licensed by Region IV believe it acceptable to informally rely on Xenon-135 to keep the reactor from inadvertently restarting while they assigned a Reactor Operator to the task of aligning the containment building for a mini-purge? Why would they think it acceptable to prioritize such a task over inserting the control banks when the reactor was in the source range with its control rods at their last critical rod heights?

In a February 28, 2009 letter I wrote to Bill Jones (the Allegation Coordinator for Region IV), I specifically mentioned my concerns regarding statements made in Action 5 of CAR 200702606 (see items 29, 33 and 34 of that letter). Despite the mention of these concerns, CAR 200702606 apparently was not considered during the investigation of Allegation RIV-2007-A-0096 in that the NRC's February 26, 2010 closure letter for that allegation makes no mention of CAR 200702606 or the fact that inaccurate information was entered into a Quality Assurance record.

§1.15. August 13, 2010 Drop-in Visit

On August 13, 2010 Adam Heflin (the Chief Nuclear Officer at Ameren) paid a "drop-in visit" to you and your deputy Marty Virgilio (see ML1136A113). The main topic of discussion at that meeting was (see Enclosure 8):

2003 Reactivity Management Event of Inadvertent Passive Shutdown; Exchange Perspectives; Confirm they are doing everything they can.

Despite what you may have been told at that meeting, I would submit to you that Ameren is definitely not doing everything they can to address the 2003-10-21 passive reactor shutdown. Please note the following:

1.15.1. Ameren has yet to submit analyses of the 2003-10-21 and 2005-06-17 passive reactor shutdowns to the Institute of Nuclear Power Operations (INPO) despite INPO specifically requesting report of such incidents in their August 10, 2007 cover letter distributing WANO SOER 2007-1, *Reactivity Management*. This should be of regulatory concern to you since per Generic Letter (GL) 82-04 the NRC is allowing its licensees to meet TMI Action Plan Item I.C.5 (the requirement that nuclear utilities have processes for obtaining Operating Experience of industry events) by participating in INPO's Significant Event Evaluation and Information Network (SEE-IN). By not sharing these two significant events with INPO, Ameren is depriving the entire nuclear industry of important Operating Experience.

1.15.2. Callaway Plant has still not shared the important details of the event with its own licensed operators. To this day, Callaway has yet to present a lesson plan on the October 21, 2003 passive reactor shutdown that includes any of the following significant details:

a. The temperature transient from 9:36 to 10:03 am which resulted in the isolation of the letdown system was the direct result of the operators failing to adequately account for the buildup of Xenon-135 following the cessation of the turbine load reduction at 9% rated reactor power. The operators mistakenly attributed this uncontrolled 9°F drop in temperature to some turbine drain valves that had coincidently been opened.
b. The reactor passively shut down due to a roughly 4°F spike in average coolant temperature following the manual trip of the main turbine.
c. For over 100 minutes the operating crew informally relied on Xenon-135 to prevent the reactor from inadvertently restarting.

§1.16. Information Notice 2011-02

In an April 27, 2010 letter to you (see ML101200401) I requested that the NRC write an Information Notice on the 2003-10-21 passive reactor shutdown. In a May 27, 2010 response (see ML101380320) I was informed that an Information Notice cannot be requested under 10CFR2.206.

Over the summer of 2010, since my 2010-04-27 petition requesting an Information Notice was rejected, the Union of Concerned Scientists (UCS) offered to disseminate the contents of

ML101200401 as an Issue Brief. On November 2, 2010 the UCS published an Issue Brief on their website entitled "*2003 Segmented Shutdown at Callaway*". Nearly 3 months after the release of the UCS Issue Brief on the topic, the NRC included the 2003-10-21 passive reactor shutdown in Information Notice 2011-02, "*Operator Performance Issues Involving Reactivity Management at Nuclear Power Plants*". The description of the incident covered in the NRC's Information Notice is not nearly as detailed as the description in the UCS's Issue Brief, which is very unfortunate since nuclear utilities are much more likely to use the NRC's Information Notice in their training programs than the UCS's Issue Brief.

I was on the review chain for IN 2011-02 and submitted a Non-Concurrence form in December 2010 (see ML110420293). The reason for the Non-Concurrence was that I did not think it appropriate for the NRC to issue an Information Notice on an event for which they did not have a complete understanding. Although I was a proponent of an Information Notice, as written IN 2011-02 does not address the most significant aspect of the October 21, 2003 event: the reason for the 107 minute delay in inserting the control banks. Knowing this reason is important because based on this reason there are potentially two quite different aspects to address:

1.16.1. If the majority of the 107 minute delay was due to the crew failing to recognize the passive reactor shutdown until the Source Range Nuclear Instruments energized, then the Information Notice should focus on strategies for ensuring that licensed operators adequately monitor core reactivity during low power operations (e.g. ensuring that the Intermediate Nuclear Range Instruments are monitored).

1.16.2. If, as the Callaway Plant Senior Reactor Operators claimed in their 2008 sworn testimonies, the NRC licensed operators were cognizant of the passive shutdown and thought it acceptable to informally rely on Xenon-135 for 107 minutes to keep the reactor from inadvertently restarting, then the Information Notice should focus on strategies for training licensed operators to ensure such a gross misunderstanding of fundamental operating concepts never again occurs.

The reason for the 107 minute delay is vitally important and I believe it unconscionable that the US NRC would close three investigations into this event and write an Information Notice without understanding why the event occurred. The NRC licenses these operators and we have a duty to the public to (1) understand the cause of significant human performance errors with regard to monitoring and controlling the nuclear fission reaction and (2) ensure that our licensees address the causes of those errors. Additionally, there are strong indications that the US NRC licensed operators intentionally concealed this event from their upper management and then lied under oath to NRC investigators.

Geoffrey Miller of Region IV is listed as the Technical Contact on IN 2011-02. In May 2011 when members of the public (e.g. Pat Sweet of the University of Missouri) called Mr. Miller to get clarification on some of the technical aspects of the 2003-10-21 passive shutdown, they were passed off to the Region IV Office of Public Affairs. As a federal agency, the NRC has a duty to

answer to the citizens of this nation. It is unconscionable that Region IV would pusillanimously use its Office of Public Affairs to stonewall citizens seeking answers to technical questions regarding a significant human performance event at a federally regulated reactor plant. Mr. Sweet's inquiry was merely with respect to whether or not the NRC believed the Callaway Plant operators were aware of the passive reactor shutdown prior to the Source Range Nuclear Instruments energizing. The assigned Technical Contact of IN 2011-02 should be able and willing to answer such a question.

§1.17. November 8, 2011 Meeting with Representative Oxford

Representative Jeanette Mott Oxford from the Missouri House of Representatives wrote a series of letters to NRC Chairman Greg Jaczko in an attempt to understand the NRC's position on key aspects of the October 21, 2003 event. Some of these letters can be found in the NRC's Agencywide Document Access and Management System (ADAMS):

- March 31, 2011 Letter from Jeanette Oxford to Greg Jaczko (ML12102A116)
- July 8, 2011 Letter from Elmo Collins to Jeanette Oxford (ML111890572)
- August 25, 2011 Letter from Jeanette Oxford to Greg Jaczko (ML11244A164)
- October 18, 2011 Letter from Jeanette Oxford to Anton Vegel (ML12053A151)
- November 17, 2011 Letter from Elmo Collins to Jeanette Oxford (ML113220478)
- January 5, 2012 Letter from Jeanette Oxford to Greg Jaczko (ML12023A085)
- April 4, 2012 Letter from Elmo Collins to Jeanette Oxford (ML12167A508)

This correspondence followed a similar pattern: (1) Representative Oxford would request from Chairman Jaczko transparent answers to a few questions regarding the October 21, 2003 event, (2) Chairman Jaczko would delegate the answering of Jeanette's concerns to Region IV, (3) Elmo Collins or one of his subordinates in Region IV would provide evasive answers to Jeanette, and (4) Jeanette would once again write Chairman Jaczko seeking transparent answers.

Jeanette Oxford is an elected representative of the people of the State of Missouri. It is unconscionable that we refuse to provide transparent answers to her questions.

On November 8, 2011 two representatives from Region IV (Anton Vegel and David Dumbacher) came to St. Louis to meet with Jeanette Oxford and discuss the October 21, 2003 event. Representative Oxford invited me to that meeting. At the meeting, Region IV presented their response to some of the concerns which Representative Oxford had written about to Chairman Jaczko. Following the meeting, Region IV sent their response to Representative Oxford in a November 17, 2011 letter.

The enclosure to the November 17, 2011 letter contradicts statements made by David Lantz in his response to Action 5 of CAR 200702606. In his response, Mr. Lantz claims that he was aware the reactor was passively shut down shortly after the manual trip of the main turbine whereas in their November 17, 2011 letter Region IV presents an analysis that, based on the

activities being performed by the operators, it is their assessment the licensed operators were not aware of the passive reactor shutdown until the Source Range Nuclear Instruments began energizing over an hour after the shutdown had occurred.

§2. Requests per 10CFR2.206

My request per 10CFR2.206 is:

The US Nuclear Regulatory Commission cite Callaway Plant for allowing inaccurate information to be entered into the Quality Assurance record CAR 200702606, Action 5.

In order to accomplish the above, I request that the NRC perform the following:

2.1. Have the Office of the Inspector General or some office other than Region IV perform an assessment of the October 21, 2003 passive reactor shutdown at Callaway Plant and determine whether or not the preponderance of the evidence suggests that operators were aware the reactor was subcritical prior to the first Source Range Nuclear Instrument energizing at 11:25 am. This assessment should include the following:

a. An analysis of the sworn testimonies from the crew members which were provided on March 31st and April 1, 2008 as part of OI Case No. 4-2007-049, specifically analyzing if the events the crew members claimed delayed the insertion of the control banks should have reasonably caused a delay.
b. Elicitation of expert opinion from NRC staff who have operated Westinghouse 4-Loop Pressurized Water Reactors as to whether or not the plant data (e.g. parameter data submitted as Enclosure 9 to this petition, control room log entries, statements made during OI interviews) indicates the operators were aware the reactor was no longer critical prior to the first SRNI energizing at 11:25 am.

2.2. If it is the opinion of the NRC experts that the operators were aware the reactor was subcritical shortly after the manual turbine trip (i.e. if it is the opinion of the NRC experts that the statements made in CAR 200702606 are accurate) then the NRC should assess what breakdown occurred in the Initial License Training (ILT) and Licensed Operator Continuing Training (LOCT) programs at Callaway Plant that enabled their operators to make such phenomenally bad judgments as:

a. Allowing a 3565 MWth reactor to passively shut down without taking any action to actively drive core reactivity.
b. Informally relying on Xenon-135 for 107 minutes to prevent the reactor from inadvertently restarting.

c. Allowing the reactor to operate in the source range for 45 minutes with the control rods still at their critical rod heights and with no Source Range Nuclear Instruments energized.

Based on their findings regarding the ILT and LOCT programs, cite violations as appropriate.

In summary, I would like the NRC to finally conduct an investigation of the October 21, 2003 passive reactor shutdown in which they seek to understand why operators whom they license would take 107 minutes to insert the control banks following a passive shutdown of the nuclear fission reaction. I believe that Region IV has a conflict of interest in this investigation since they have already investigated the incident three times (RIV-2007-A-0028, OI Case 4-2007-049, and RIV-2007-A-0096) and have thus far not been willing to make a determination as whether or not the operators were aware of the passive shutdown prior to the SRNIs energizing. For that reason, I would like this investigation to be assigned to an office other than Region IV.

The intents of Region IV's investigations were merely to determine if a narrow reading of any NRC regulations had been violated. None of their investigations sought to:

- understand when the NRC licensed operators first became aware that the reactor was no longer critical
- understand why the NRC licensed operators would think it acceptable to informally rely on Xenon-135 to maintain the reactor subcritical when the control banks were available to be inserted
- understand why Ameren never did a root cause analysis of the event
- determine whether or not current NRC regulations are adequate to ensure future reactor shutdowns are more actively managed
- determine whether or not a broader reading of the NRC regulations had been violated
    - does intentionally allowing the reactor to passively shut down violate the NRC's requirement for procedure use and compliance since the Reactor Shutdown procedure was written with the assumption that the control banks would be used to actively shut down the reactor
    - does informally relying on Xenon-135 to passively keep the reactor from restarting violate the requirement for procedure use and compliance since the Reactor Shutdown procedure was written with the assumption that the control banks would be used to actively shut down the reactor and therefore would be present in the core to actively keep the reactor from restarting
    - does operating in the source range for 45 minutes with no Source Range Nuclear Instruments energized and the Boron Dilution Mitigation System inoperable violate the plant's Technical Specifications since the Technical Specifications were written with the assumption that the reactor would not be allowed to passively enter the source range with its control rods still at their critical rod heights and therefore the P-6 permissive should have been adequate to define when the SRNIs are required.

The NRC has yet to adequately investigate this event and still cannot answer the most basic questions about it: (1) when did the operators first become aware the reactor was no longer critical, (2) why did the operators informally rely on Xenon-135 to keep the reactor from inadvertently restarting, and (3) why did the operators not inform the utility's upper management that the reactor had passively shut down.

A major flaw in our system of government, and even in industry, is the latitude allowed to do less than is necessary. Too often officials are willing to accept and adapt to situations they know to be wrong. The tendency is to downplay problems instead of actively trying to correct them. – Admiral Hyman G. Rickover, 1982

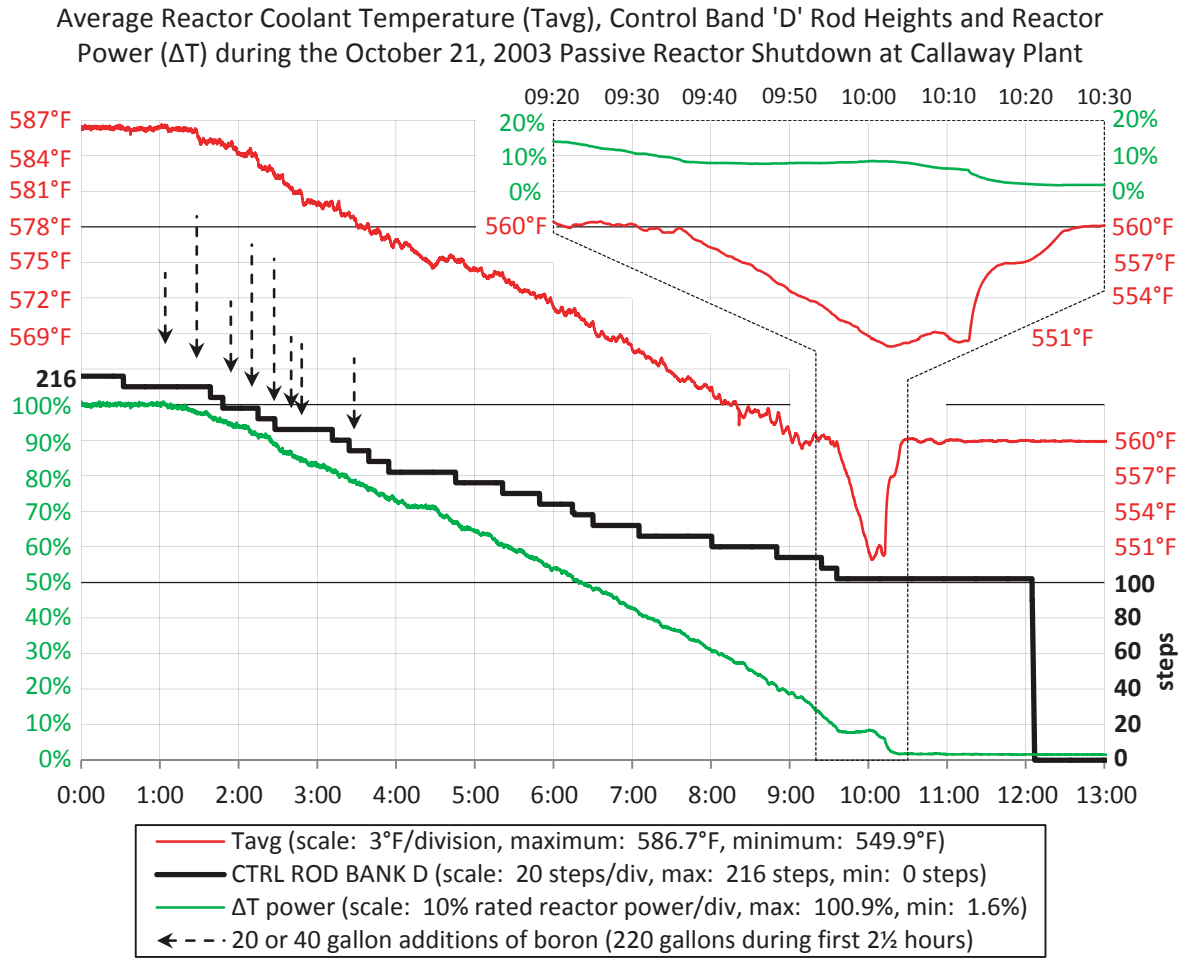


Figure 1: Plot of Average Coolant Temperature (T_{avg}), Primary Calorimetric power (ΔT) and Control Bank 'D' rod heights during the October 21, 2003 down power and passive reactor shutdown. Note the severe temperature transient which began at 09:36 (see inset plot in upper right corner of the graph). Turbine first stage steam pressure data (not shown) indicates that the operators stopped lowering turbine-generator loading at 09:36 with reactor power at 9%. Over the next three minutes, negative reactivity due to Xenon-135 caused power to continue to lower another 1%. The power mismatch between the steam demanded by the turbine throttle setpoint and the power being produced by fission caused T_{avg} to immediately begin to lower, thereby inserting positive reactivity which countered the negative reactivity being inserted by the continual buildup of Xenon-135. Around 09:39 the positive reactivity being inserted by the lowering temperature matched the negative reactivity being inserted by Xenon-135 causing reactor power (as indicated by core ΔT) to stabilize at approximately 8%. With a 1% power mismatch present, over the next twenty minutes T_{avg} continued to steadily lower and thereby counteract the continual buildup of xenon. Shortly after 10:00 the crew began to again lower turbine-generator loading in response to the Shift Manager's decision to take the turbine off-line following the letdown isolation. The renewed lowering of generator loading caused steam demand to lower below fission power and thereby allowed T_{avg} to temporarily recover slightly. During this time period (10:03 to 10:09), the negative reactivity being inserted by Xenon-135 was now being counteracted by the positive reactivity being inserted by the load decrease (the plant had a negative power coefficient of reactivity). Generator loading was again stabilized around 10:09 causing T_{avg} to resume falling, which is the expected passive response of the reactor plant to Xenon-135 buildup. The operators failed to grasp the reactor dynamics behind the transient and assumed the 10°F drop in T_{avg} was being caused by malfunctioning steam line and turbine drain valves.

Table I: Overview of the October 21, 2003 Incident

2003-10-20	7:21	Safety-related Inverter NN11 failed. Callaway Plant entered Technical Specification 3.8.7.A which required them to either repair the inverter within 24-hours or begin lowering reactor power in preparation for a forced shutdown.
21-Oct-03	0:37	Electrical Maintenance finished repairing Inverter NN11 and returned it to service to retest it. It immediately failed.
	1:00	Callaway Plant commenced lowering reactor power at 10%/hour in preparation for a forced shutdown. This action was prudently taken over six hours ahead of schedule to allow the crew ample time for the downpower and shutdown.
	7:21	24 hours had elapsed since the inverter first failed, so Callaway Plant entered TS 3.8.7.B which required them to either repair the inverter within the next 6 hours or shut down the reactor.
	9:36	At around 10% power the operators quit lowering reactor power. Since they were two hours ahead of schedule, their intention was to remain at 10% power for two hours to allow the electricians more time to repair the inverter. To allow adequate time for performing the Shutdown Margin calculation and boration, the decision was made to shut down the reactor at noon if repairs to the inverter were not progressing.
	9:39	The operators failed to account for the buildup of Xenon-135 and a 22°F/hour drop in average reactor coolant temperature ensued which they mistakenly blamed on some recently operated turbine drain valves.
	10:00	The reactor's purification system automatically isolated. Also, reactor coolant temperature dropped below the Minimum Temperature for Critical Operation (MTCO).
	10:13	The operators manually tripped the main turbine in order to recover temperature above the Minimum Temperature for Critical Operation so that they could continue to maintain the reactor critical while the electricians continued with repairs to the inverter.
	10:18	The operators failed to notice the reactor passively shutting down.
	10:39	The operators failed to notice reactor power entering the source range.
	11:25	The channel 2 Source Range Nuclear Instrument energized causing an alarm to annunciate on the reactor's Main Control Board. Everyone in the reactor's Main Control Room became aware that the reactor is no longer critical but no one informed the plant's upper management.
	12:00	Noon was reached with the failed inverter not yet repaired and with repairs not looking promising. Upper management was thus expecting the operators to shut down the reactor.
	12:05	The operators began inserting the control banks. No one outside the Main Control Room was aware that, instead of using the control rods to shut down the reactor, the control rods were being inserted into a reactor core that had passively shut down nearly two hours earlier.

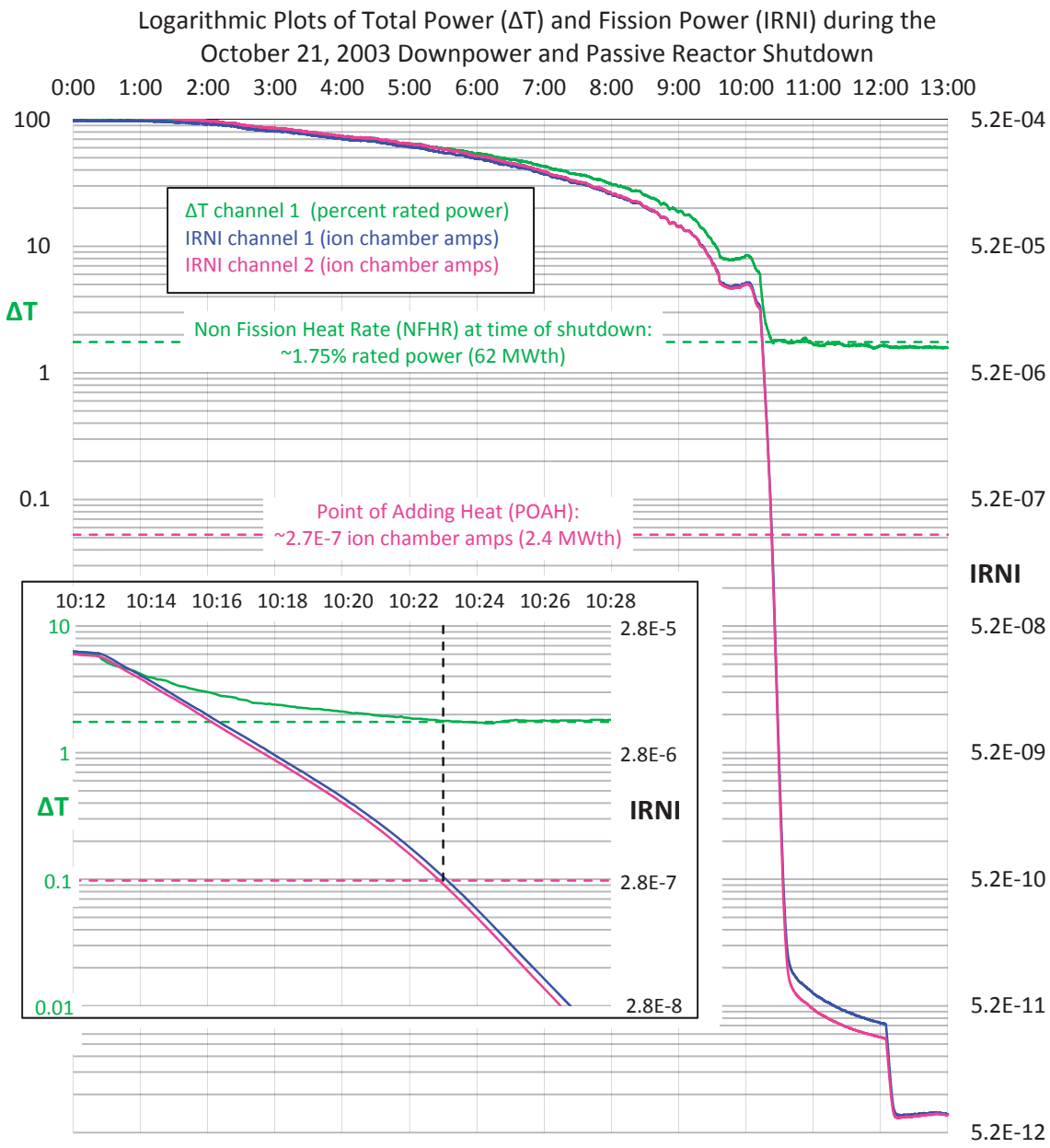


Figure 2: Logarithmic plots of Total Power (as represented by ΔT instrument readings) and fission power (as represented by Intermediate Range Nuclear Instrument currents). Note the offset which developed between 00:00 and 10:00 as IRNI currents lowered slightly more than core delta temperatures in response to the down power. Part of this offset is due to an actual divergence and part is due to indication limitations. During the downpower, the programmed lowering of average coolant temperature affects neutron leakage and thereby the neutron signal reaching the IRNIs; this causes indicated fission power (e.g. IRNI currents) to lower more than actual fission power. Also during the down power the weighted half-life length of the fission product inventory increases; this slightly buffers total power but does not affect fission power. Because of the offset developed by these effects, IRNI instruments cannot be scaled to give an accurate thermal power level. However, this does not prevent them from performing their primary task of indicating relative changes in fission rate across several decades of power during relatively short time frames (i.e. several to dozens of minutes). The inset graph displays the departure of total power and fission power as the Non-Fission Heat Rate (NFHR) and Point of Adding Heat (POAH) are approached.

Table II: Noteworthy Activities Performed prior to Securing the Downpower

The "mark" column refers to the letter on Figure 4 which marks the activity/milestone in relation to the plant conditions which were present and the other activities performed.		
mark	**time**	**Activity/Milestone**
A	08:17	Cooling Tower Blowdown secured to support Chemistry evolutions.
B	08:21	Inverter NN11 retested and failed. Crew enters off-normal procedure for "Loss of Safety Related Instrument Bus". The dip in Tavg on the graph of Figure 4 is due to the momentary opening of a Steam Generator Atmospheric Steam Dump when NN11 failed.
C	08:33	Control Room actions for "Loss of Safety Related Instrument Bus" complete except for an auxiliary feedwater valve line up surveillance assigned to the Equipment Operators.

Table III: Noteworthy Activities Performed during the Temperature Transient

The "mark" column refers to the letter on Figure 4 which marks the activity/milestone in relation to the plant conditions which were present when the activity was being performed.		
mark	**time**	**Activity/Milestone**
D	09:36	For unstated reasons, the crew secured the generator load decrease at 9% rated reactor power. Xenon-135 buildup caused reactor power to continue to passively lower for another three minutes and stabilize at 8% rated reactor power, resulting in an ~1% power mismatch.
		The power mismatch caused T_{avg} to begin to lower and passively insert positive reactivity. This positive reactivity was inserted at a rate which matched the negative reactivity being inserted by the buildup of Xenon-135 resulting in reactor power remaining stable at 8% rated power while temperature steadily fell at 22°F/hour.
		Control banks C and D were inserted 6 steps since, prior to stabilizing the turbine load, the trend in reactivity management was to occasionally actively insert <u>negative</u> reactivity to counter act the passive positive reactivity insertion resultant from the turbine load decrease and the programmed decrease in average coolant temperature. This was the last active insertion of negative reactivity for the next 2½ hours.
		It was at about this time that the operators placed the turbine drains in service per the Reactor Shutdown procedure. About a dozen minutes later the operators mistakenly believed that faulty turbine drains were the cause of the temperature transient (see page 9 of Reference 9).
E	09:47	Operators began adding water to the Volume Control Tank (VCT) in order to dilute boron from the reactor coolant system to assist in mitigating the temperature decrease.
		Also about this time the operators responded to the lowering reactor coolant temperature by performing an attachment in the shutdown procedure to minimize excessive cooling. One of the steps taken was to reclose the turbine drains. Indication was lost on the turbine drain valve hand switch (which controls 13 different drain valves) so the crew dispatched Equipment Operators to visually identify any valves which were not closing (see page 10 of Reference 9).
F	09:59	Letdown system automatically isolated on low Pressurizer water level; not all valves functioned properly. The crew enters the off-normal procedure for "Loss of Letdown".
		At about this time average reactor coolant temperature fell below 551°F, the Minimum Temperature for Critical Operations (MTCO).
	10:00	Operators secured the water addition to VCT. For the next 2 hours, no active means are used to control reactivity.
		The operators recommenced lowering turbine-generator loading to take the turbine off-line
G	10:12:35	Operators manually tripped the turbine-generator at an average coolant temperature of 550.4°F and 6% rated reactor power. The resultant rise in Tavg caused the reactor to go substantially subcritical. With no operator action, the reactor passively transited towards the Point of Adding Heat (POAH).

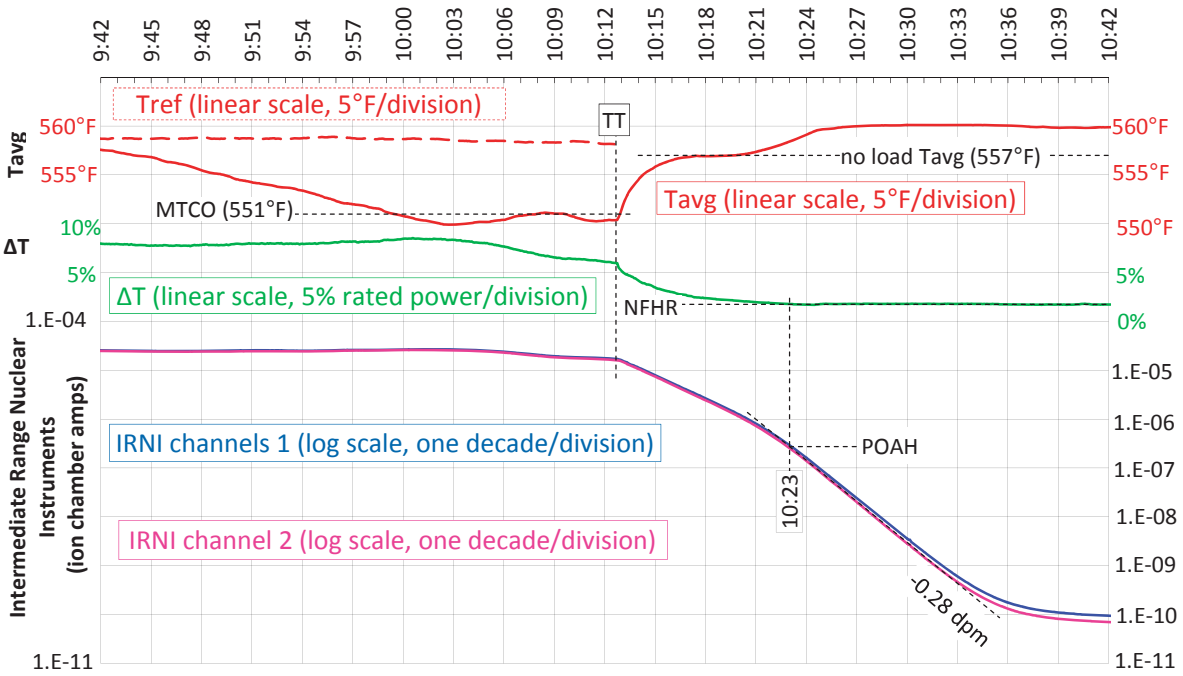


Figure 3: Plot of Average Coolant Temperature (T_{avg}), Primary Calorimetric power (ΔT) and Intermediate Nuclear Instrument currents (IRNI) on October 21, 2003. The sharp rise in T_{avg} was caused by the power mismatch resulting from manually tripping the turbine at 6% power and 550.4°F with the steam dumps set at 1092 psig (557°F). The negative reactivity inserted by this temperature rise caused the reactor to passively shut down. The leveling out of the ΔT trace at 10:23 indicates the Point of Adding Heat. The leveling out of the IRNI traces at 10:39 indicates entry into the source range. See Figure 4 for plant evolutions occurring during this time frame.

Table IV: Noteworthy Activities Performed as the Reactor Passively Lowered to Source Range

The "mark" column refers to the letter on Figure 4 which marks the activity/milestone in relation to the plant conditions which were present and the other activities performed.		
mark	**time**	**Activity/Milestone**
H	10:18	The operators placed a 75 gpm letdown orifice in service and exited the off-normal procedure for "Loss of Letdown". The operators were still in the off-normal procedure for "Loss of Safety Related Instrument Bus" due to the Auxiliary Feedwater surveillance having not yet been completed by an Equipment Operator. The NRC did not find that the implementation of either off-normal procedure prevented the control room operators from inserting the control rods at any time during the shutdown (see page 4 of the Enclosure of Reference 8). Instead of inserting the control banks, the Control Room Supervisor assigned the Reactor Operator the task of placing the 45 gpm letdown orifice in service per the normal operating procedure in order to optimize plant chemistry by raising letdown flow from 75 gpm to 120 gpm.
	10:19	For unstated reasons, the operators raise the lift setpoint of the condenser steam dumps, causing T_{avg} to begin to rise from 557°F to 560°F and further lower K_{eff}.
I	10:23	Approximate time fission power lowered below the Point of Adding Heat (POAH) as indicated by total power (e.g. the ΔT instruments) leveling out as fission power (e.g. the IRNI currents) continued to lower exponentially. A nominal -1/3 dpm SUR developed at this point due to the absence of temperature-reactivity feedback (i.e. non-fission heat sources were able to maintain temperature as fission power lowered, so a lowering of fission rate did not cause a corresponding lowering of temperature and a subsequent insertion of positive reactivity). As reactor power passively lowered towards the source range, the licensed operators were assigned normal procedure tasks for placing cooling tower blowdown in service (which had been secured at 08:17) and securing an intake pump (two intake pumps were originally running but, with the reduced evaporation rate due to the downpower, one pump could now be secured).
J	10:34	Licensed operators complete assignments for placing cooling tower blowdown in service and lowering intake flow.

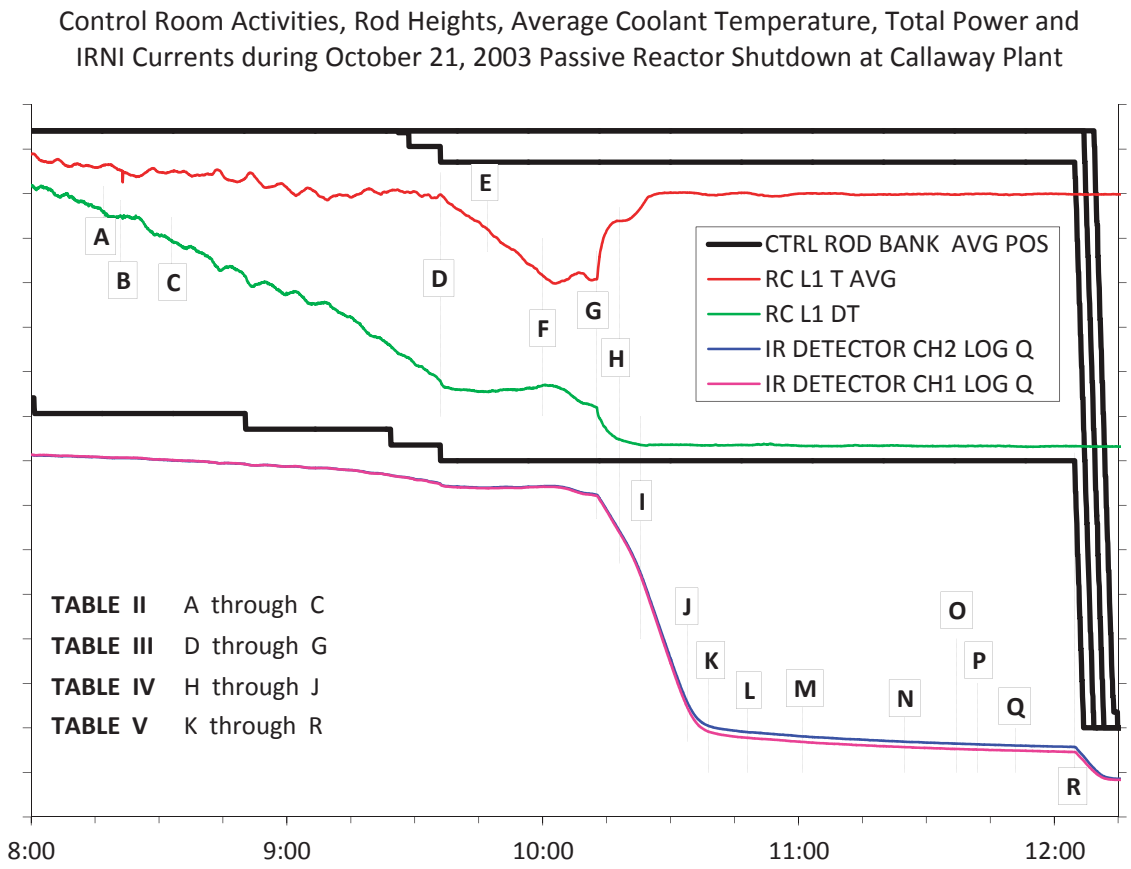


Figure 4: Plot of Control Bank rod heights, Average Coolant Temperature (Loop 1 Tavg instrument), total power (Loop 1 ΔT instrument) and Intermediate Range Nuclear Instrument (IRNI channels 1 and 2) currents on October 21, 2003. The reactor passively shut down shortly after the turbine was manually tripped at 10:13 and reached the source range about 26 minutes later. A nominal -1/3 dpm SUR developed as power fell below the POAH. The slight drop in reactor power from 10:39 to 12:05 was caused by a lowering of subcritical multiplication resulting from the continued buildup of Xenon-135. The operators began inserting the control banks at 12:05 and completed at 12:15. The control banks consisted of four banks (A, B, C, D) whose insertion is staggered. The 'D' bank rods were the first to insert and the 'A' bank rods were the last. The letters on this plot annotate various activities which are found in Tables II through V. Items 'B' and 'O' indicate, respectively, the times when the crew entered and exited the off-normal procedure for "Loss of Safety Related Instrument Bus". Items 'F' and 'H' indicate, respectively, the times when the crew entered and exited the off-normal procedure for "Loss of Letdown". The NRC did not find that the implementation of either off-normal procedure prevented the control room operators from inserting the control rods at any time during the shutdown.

Table V: Noteworthy Activities Performed with the Reactor in the Source Range

The "mark" column refers to the letter on Figure 4 which marks the activity/milestone in relation to the plant conditions which were present and the other activities performed.

mark	time	Activity/Milestone
K	10:39	IRNI traces leveled off indicating that most Delayed Neutron Precursors (DNPs) had decayed and neutron population was now being determined by source neutrons and subcritical multiplication. An unperceivably slight negative startup rate remained (-0.07 dpm) as the continual buildup of Xenon-135 lowered subcritical multiplication. Due to the control rods still being at their last critical rod heights, subcritical multiplication was too great to allow the IRNI currents to fall below the reset point required to energize the Source Range Nuclear Instruments (SRNIs). As a result, the reactor was in the source range without: an audible neutron count, automatic protections afforded by the Boron Dilution Mitigation System (BDMS), the SRNI high flux trip (which comes in 5 decades below the IRNI high flux trip), and SRNI indication.
L	10:48	The reactor operator completed placing a 45 gpm letdown orifice in service per the normal operating procedure. There is no indication in the logs of any activities preventing the insertion of the control banks.
M	11:01	The second of three condensate pumps was secured. The basis for this step is to minimize "house" electric loads. While performing this activity, the crew was operating in the source range with: (1) no SRNIs energized, (2) the control rods still at their last Critical Rod Heights and (3) no formal calculation present to verify Xenon-135 levels were sufficient to prevent an inadvertent reactor restart during postulated dilution or cooldown events.
N	11:25	The Channel 2 Source Range Nuclear Instrument energized with an initial reading of 3044 cps. This should have caused the SR HI VOLT FAIL alarm on the main control board to annunciate.
O	11:34	The auxiliary feedwater surveillance required to exit the off-normal procedure for "Loss of Safety Related Instrument Bus" was completed and delivered to the Control Room Supervisor.
	11:37	The crew exited the off-normal procedure for "Loss of Safety Related Instrument Bus".
P	11:38	The Channel 1 SRNI energized with an initial reading of 2593 cps. This should have caused the SR HI VOLT FAIL alarm on the main control board to annunciate as the alarm cleared.
	11:40	The motor driven Start Up Feed Pump was started in preparation for securing the final turbine driven main feed pump.
	11:42	The reactor operators commenced a Containment Minipurge.
		The Shift Technical Advisor commenced a Shutdown Margin Calculation. This calculation was not completed and reviewed until 12:55. From 10:13 (when the Shift Manager recognized the reactor would go subcritical – see page 11 of Reference 9) to 12:05 (the time control rod insertion commenced) the crew was informally relying on thumbrules and Xenon-135 estimates from a Xenon Prediction to ensure that sufficient shutdown margin was present to prevent an inadvertent reactor restart in the event that an unplanned dilution or cooldown were to occur.
Q	11:51	The operators secured the last turbine driven main feed pump.
R	12:05	The operators began inserting the control banks.

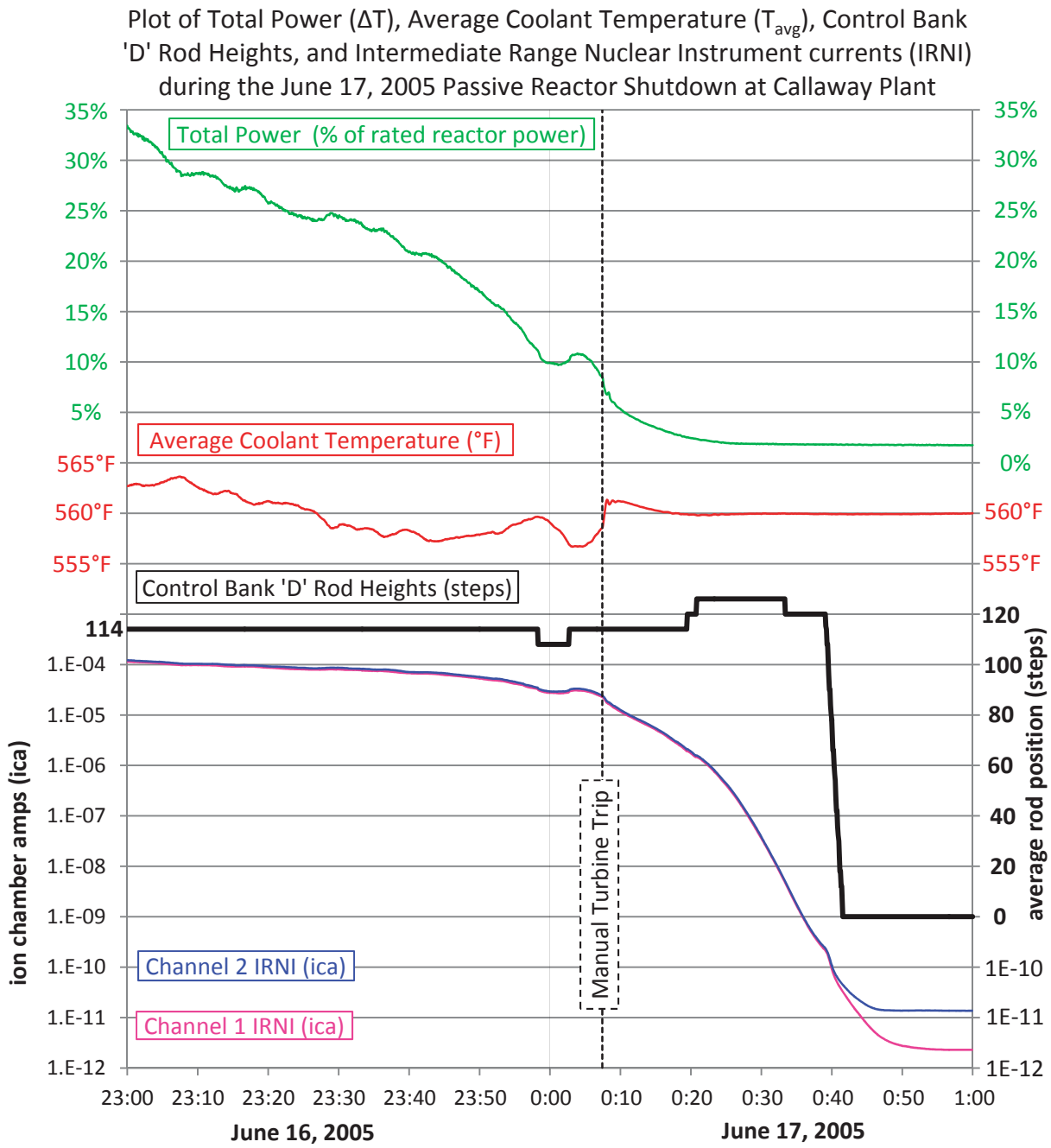


Figure 5: At 19:02 on June 16, 2005 Callaway Plant entered a 6 hour Technical Specification shutdown statement due to a failed power supply to an Engineering Safeguards Feature (ESF) cabinet. By 23:00 the reactor was around 33% power and shutting down at nominally 30%/hour. At 00:07:25 on June 17, 2005 the reactor operators manually tripped the main turbine. Immediately following the turbine trip, T_{avg} rose 2.5°F in a 35 second time period. Just like on October 21, 2003, the sharp spike in T_{avg} caused the reactor to inadvertently passively shut down. By 00:10 fission rate had already dropped to half its pre-turbine trip value when the operators were notified that the ESF cabinet had been restored to operable and the shutdown was no longer required. Unaware of the passive shutdown, the Reactor Operator withdrew control rods six steps at 00:19:30 and again at 00:20:50. Noticing that the reactor failed to respond as expected, at 00:25 the RO informed the CRS that the reactor had passively shut down. The crew began manually driving in the control rods at 00:39. The incident was not documented until February 2007.

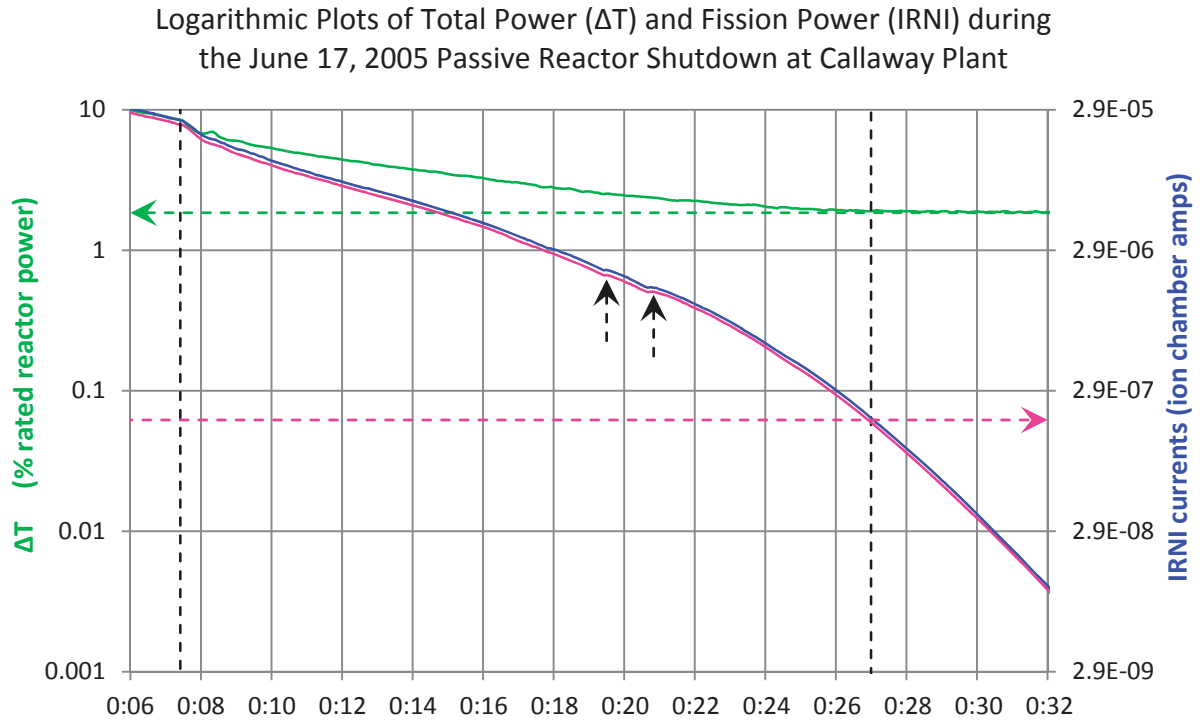


Figure 6: Logarithmic plots of Total Power (as represented by ΔT instrument readings) and fission power (as represented by Intermediate Range Nuclear Instrument currents) during the June 17, 2005 passive reactor shutdown at Callaway Plant. The vertical line at 0:07:25 indicates the time of the manual turbine trip which caused a sharp rise in Tavg with reactor power at 8.5% rated power. The negative reactivity inserted by this temperature increase caused the reactor to go substantially subcritical. As fission power lowered exponentially (as indicated by the IRNI currents) the decrease in total power was not proportional. Instead of lowering exponentially, total power began to asymptotically approach the Non-Fission Heat Rate (as indicated by the dashed green line on the graph). The mismatch between fission power and total power has a strong impact on Temperature-Reactivity feedback causing it to degrade as MODE 2-Descending is approached and causing it to completely disappear at the Point of Adding Heat (POAH). Although temperature continues to directly affect reactivity as the NFHR is approached, Temperature-Reactivity feedback is lost because falling fission power from a negative reactivity insertion does not immediately affect temperature since non-fission heat sources "buffer" temperature from dramatically lowering. The POAH is denoted by the dashed pink line on the graph and the approximate time the POAH was reached is noted by the dashed vertical line at 0:27. Since there is some subjectivity as to exactly when total power reaches the Non-Fission heat rate, the POAH is just a rough estimate. The arrows at 0:19:30 and 0:20:50 indicate 6 step control rod withdrawals which were done by the reactor operator prior to recognizing the passive shutdown.

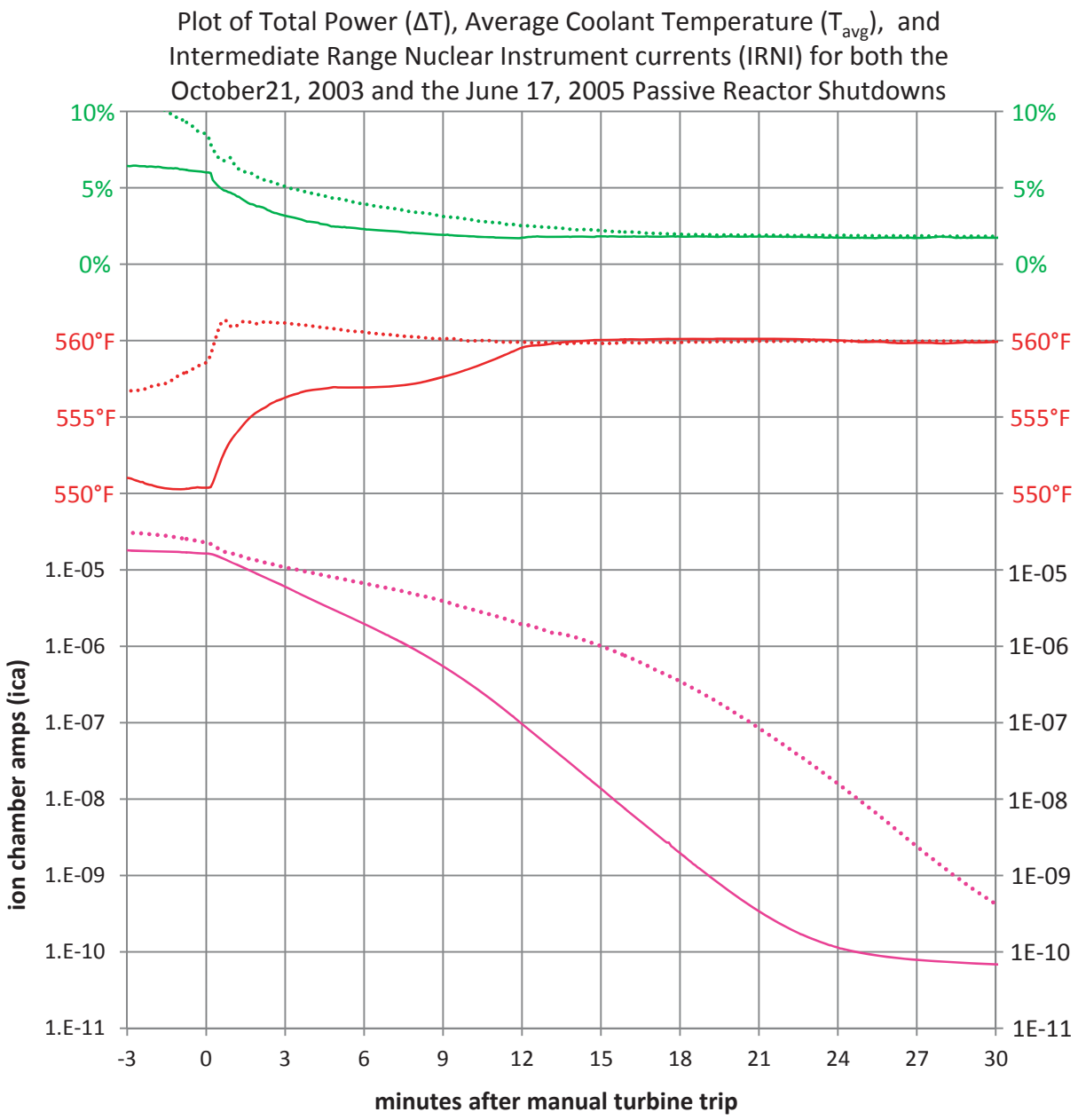


Figure 7: Comparison of the critical parameter data from the October 21, 2003 and June 17, 2005 passive reactor shutdowns at Callaway Plant. The "dashed" data is the June 2005 data. Notice that for both shutdowns the reactor was in MODE 1 when the turbine was tripped and for both shutdowns the reactor went substantially subcritical due to a sharp spike in average coolant temperature caused by a momentary loss of steam demand as steam header pressure rose to the lift point of the condenser steam dumps. The Point of Adding Heat and a nominal -1/3 dpm start up rate were reached quicker for the October 2003 transient because the reactor was closer to the POAH when the turbine was tripped (in 2003 fission power was just over twice non-fission power whereas in 2005 fission power was nearly four times non fission power) and because the negative reactivity insertion was larger due to a larger temperature spike. Similar to a reactor trip, on October 21, 2003 reactor power entered the source range about 25 minutes after the turbine trip. Neither passive reactor shutdown was documented in the plant's corrective action program until it was accidently uncovered in February 2007.

Callaway Action Request System

Action Request

Cars Number	Cars Type	Status	Discover Date	Due Date
200701278	Adverse Condition	InProcess	2/10/2007	10/17/2007

Originator	Department	Phone
Criscione, Lawrence (14827)	O	66113

Lead	Department	Phone
Milligan, James (4002)	O	68720

SS Notified	NMR	ASME	NOW	Safeguards	Per Safety	Ec
False	False	False	False	False	False	Fa

Summary Description

Analysis of Past Reactor Shutdowns - RF15 Preparation Concerns

Description

Condition Description (Problem Statement)
On 8/15/2002 the eDNA polling frequency for SEN0035A and SEN0036A switched from hourly to every five seconds (allowing collection of useful data for analysis of the response of reactor power to parameters causing reactivity changes). Callaway Plant has shutdown nine times from MODE 2 since then. During three of these nine shutdowns, the plant intended to remain in MODE 2 while equipment was repaired. For the remaining six shutdowns, the plant intended to only transition through MODE 2. Analysis of eDNA data indicates the operating crews have done an acceptable job of safely shutting down the plant when not required to maintain MODE 2. Analysis of the eDNA data and operating procedures also indicates a proceduralized strategy for maintaining MODE 2 does not exist and the lack of a proceduralized strategy has prevented the plant from successfully maintaining the reactor in a MODE 2-descending condition. In two attempts to maintain MODE 2-descending, Callaway Plant has been unsuccessful both times.

Details of the condition
The specifics of the nine shutdowns are discussed below. The impetus for reviewing the past shutdown data was to ensure OTG-ZZ-00005 adequately defends against the error traps from two prominent industry events:

- OE8267, Unrecognized Reactivity Mismanagement While Performing a Reactor Shutdown
- OE20136, Unplanned Operation Below the Point of Adding Heat

OE8267 documents an operator excessively pulling rods (for two minutes) in an attempt to stabilize reactor power at 1 E-8 ica to take data.

OE20136 documents an operating crew unwittingly entering MODE 3 and then returning to MODE 2 while attempting to maintain the reactor critical while equipment was being repaired.

Industry operating procedures have traditionally required power **ascensions** be stabilized at 1 E-8 ica to obtain critical rod height, boron concentration and temperature data. A misunderstanding of the reasons for this data led many plants to include steps in their shutdown procedures for stabilizing power at 1 E-8 ica until the rod height, boron and temperature data can be taken. Attempting to maintain reactor power stable, below the point of adding heat, during a shutdown induced Xenon transient is an unnecessary challenge to the operator. At Callaway, this feedback was provided to Operations Management by the Operating Crew who performed the March 26, 2005 reactor shutdown. The issue was tracked as CARS 200501962 and the requirement to remove collection of data at 1 E-8 ica during power descension was removed from OTG-ZZ-00005 in Revision 022.

Operations' response to OE20136 is documented in Action Notice 200501882 which states OTG-ZZ-00005 "provides the necessary and sufficient instructions for shifting reactor power monitoring from Power Range instrumentation to Intermediate Range instrumentation". The revision in effect at the time did contain steps which

forced the operator to look at the Intermediate Range instruments (e.g. observing the power at which permissives clear, taking data at 1 E-8 ica, observing instrument overlap) but it had (and still has) no specific instructions to shift to monitoring the Intermediate Range instrumentation in MODE 2. Additionally, OTG-ZZ-00005 assumed (and still assumes) the operating crew can secure the shutdown once the turbine is off-line by merely holding in the procedure. No recognition is made that maintaining MODE 2 requires any extra actions; aside from simply delaying performance of the steps to shutdown and enter MODE 3.

The eDNA data from the nine shutdowns from MODE 2 since October 2002 are attached to this CARS.

Shutdown through MODE 2 for RF12: At 0129, with reactor power around 2 E-5 ica, the Reactor Operator slightly inserted rods to lower power to 1 E-8 ica to take procedurally required data. The combined effect of the slight rod insertion and the Xenon transient caused the reactor to shutdown. At 0140, with reactor power at 1 E-8 ica, the Reactor Operator slightly pulled rods to stabilize reactor power. The eDNA data indicates the Reactor Operator immediately recognized the reactor was shutdown and prudently abandoned attempts to stabilize power at 1 E-8 ica. The reactivity data was taken as reactor power decayed to 4 E-9 ica. The only issue of concern from this shutdown has already been addressed by removing the requirement to stabilize at 1 E-8 ica for data collection from OTG-ZZ-00005.

Maintaining MODE 2 during RF12 ascending to repair MG set: For over 9 hours the operating crews successfully maintained MODE 2-ascending while awaiting the repair of equipment. The reactor was intentionally shutdown with rods at 0215 to support maintenance. Procedural instructions for maintaining MODE 2-ascending are adequate. The significant difference between MODE 2-ascending and MODE 2-descending is the lack of a Xenon transient.

Shutdown through MODE 2 for Summer Reliability Outage to repair leaking RCS Safeties: No issues exist from this shutdown. The reactor was successfully stabilized at 1 E-8 ica for five minutes and then intentionally shutdown with rods.

Unsuccessfully Attempting to Maintain MODE 2 during NN11 repair: Two trends are attached to this CARS; one over a one hour time frame from 0945 to 1045 and the other over a five hour time frame from 0800 to 1300. The AutoLog entries are also attached. At 0821 the 'A' SG ASD opened for approximately 10 seconds and OTO-NN-00001 was entered. The plant was in a 6 hour shutdown statement due to expiration of the Completion Time of LCO 3.8.7 from an earlier failure of NN11. At 0924 and again at 0936 control rods were inserted six steps, apparently to match Tavg with Tref.

At the time of the second rod insertion (0936), Delta T Power was 8%, Tavg was 560°F (1°F above Tref) and Pressurizer Level was 28.5%. Over the next twenty-eight minutes, Tavg and Pressurizer Level steadily lowered while turbine impulse pressure, Delta T Power and IRNI ion chamber amps stayed relatively stable. No explanation for the transient exists in AutoLog and the transient is not documented in the CARS database. Tavg lowered below the Minimum Temperature for Critical Operation from 09:59:35 to 10:07:55 and from 10:09:45 to 10:12:50. Entry into T/S 3.4.2 was not noted in AutoLog. At 0947, with Delta T Power at 7.7%, Tavg at 556°F and Pressurizer Level at 23.3%, the operating crew initiated a series of dilutions. Since no dilutions had been performed since the night shift when 10 borations were performed prior to 0330, it is likely the dilutions initially added some boron to the VCT. Letdown isolated at 0959 and the crew entered OTO-BG-00001. The temperature transient ended at 1004 with Delta T Power at 8.1%, Tavg at 550°F and Pressurizer Level at 18.7%. No documentation of the reason for the temperature transient could be found.

At 1013 the turbine was tripped and the crew logged entry into MODE 2; Delta T Power was 4.9%, Tavg was 552° F, IRNI power was 1.4 E-5 ica and SUR was -0.01 dpm. One minute later (1014) Delta T Power was 4%, Tavg was 555°F, IRNI was 1E-5 and SUR was -.16 dpm. The 3°F temperature rise caused a transient which caused the reactor to shutdown.

At 1018, OTO-BG-00001 was exited. Delta T Power was 2.4%, Tavg was 557°F, IRNI power was 2.4E-6 ica and SUR was -0.16 dpm. By the time 1 E-8 ica was reached the maximum negative start up rate (for the transient) of -.29 dpm had already been reached; Delta T Power was 1.8 %, Tavg was 560°F and the plant was likely in MODE 3. The control rods were inserted 100 minutes later at 1205. There is no indication in the control room log as to why control rods were not inserted earlier; there were no abnormal evolutions after exiting OTO-BG-00001 at 1018. Had NN11 been restored in the 150 minutes between actually entering MODE 3 and administratively entering MODE 3, insertion of the control banks would still have needed to occur to comply with the startup procedure. It is unclear whether the delay in inserting the control rods was due to the operating crew not recognizing the reactor had shutdown or due to the operating crew intentionally delaying entry into MODE 3. Several Operating Supervisors, Reactor Operators and Shift Managers were interviewed but none could explain why the crew would remain subcritical for over 1.5 hours prior to inserting the control banks.

There is no record in the CARS database that any of the following were ever addressed:

- The 10°F temperature transient which led to a Letdown isolation and OTO entry [see Screening Comments]
- Tavg dropping below the MTCO and no entry into T/S 3.4.2
- The inability of the crew to maintain MODE 2
- The reason for waiting 100 minutes after MODE 3 entry before inserting control rods and for waiting 2.5 hours before administratively declaring MODE 3.

Shutdown through MODE 2 for Refuel 13: No attempt was made to stabilize reactor power at 1 E-8 ica. This issue has already been addressed with removal of the requirement for taking data at 1 E-8 ica from OTG-ZZ-00005.

Shutdown through MODE 2 for 'B' ESW Repair: The rate of Xenon buildup prevented the Reactor Operators from stabilizing reactor power at 1 E-8 ica. Data was taken with an approximately -0.05 dpm start up rate. The difficulty in stabilizing at 1 E-8 ica was critiqued by the Operating Crew, and Operations Management successfully addressed the issue 9 months later by removing the data taking requirement from Revision 022 of OTG-ZZ-00005. Two more shutdowns from MODE 2 occurred prior to issuance of OTG-ZZ-00005, Rev. 022.

Unsuccessfully Attempting to Maintain MODE 2 during SA075B repair: The Operating Crew expected to maintain MODE 2 while awaiting repair of SA075B. MODE 2 was entered at 0007. The turbine was tripped at 0008 by eDNA (slight difference from log time is due to computer and control room clock not in sync - eDNA time is used here to correlate with other eDNA data). Based on Loop Delta T Power no longer decaying at the same rate as IRNI ion chamber amps, eDNA data indicates the Point of Adding Heat was also approached at 0008.

In the three minutes just prior to and after the turbine trip, steam generator pressures rose 54 psi to 1087 psig and RCS Tavg rose 4°F to 561°F. Interviews with the Reactor Operators indicate the steam dumps control above 1092 psig when set to 1092 psig with the potentiometer. Additionally, there appears to be a lag in the opening of the steam dumps. The 4°F temperature rise, coincident with the decay of temperature feedback due to approaching the POAH and the continued buildup of Xenon, caused SUR to change from -0.03 dpm (prior to turbine trip) to -0.15 dpm. SA075B was restored at 0010. Control rods were pulled 6 steps at 0019 and again at 0021. Based on the unresponsiveness of the reactor to the rod pulls, at 0025 the operating crew determined MODE 2 could not be maintained due to the Xenon transient. Also at 0025, Reactor Power had dropped below the Point of Adding Heat (based on eDNA data indicating Loop Delta T power no longer decaying). Without any rod insertion, a -1/4 dpm startup rate was present by 0030.

The entry into MODE 3 and subsequent return to MODE 2 took 31 hours to accomplish. Despite this loss of generation capacity during the high demand period of late June (a 7 figure loss of revenue), there is no record in the CARS database that the inability of the crew to maintain MODE 2 due to inadequate guidance in OTG-ZZ-00005 was ever addressed.

Shutdown through MODE 2 for Refuel 14: No attempt was made to stabilize reactor power at 1 E-8 ica. This issue had already been addressed by Action Notice 200501962 but was not yet incorporated into the revision of OTG-ZZ-00005 in use at the time.

Shutdown through MODE 2 for High Pressure Turbine Repair: No issues exist from this shutdown. This is the only reactor shutdown from MODE 2 that has occurred with the new steam generators. Analyzing system responses during this shutdown (i.e. steam dump and critical parameter responses when the turbine was tripped) could prove beneficial in developing a strategy for maintaining MODE 2.

Summary of Data from the NN11 and SA075B Shutdowns: In both instances the plant desired to remain in MODE 2. Both shutdowns were **caused by a several degree rise in temperature, near the POAH, when the turbine was tripped**. A strategy for tripping the turbine low in MODE 1 (well above the POAH) and setting steam dumps below 1092 psig may have prevented both trips. This strategy needs to be developed prior to RF15 if OSP-AC-00005 is to be performed prior to reactor shutdown.

Recommended Additional Actions to Resolve this Issue

There is currently a major revision to OTG-ZZ-00005 in review (should be issued as Revision 024). Reviewer comments will address the concern of the need to direct the operators to monitor the Intermediate Range nuclear instruments in MODE 2.

The revision to OTG-ZZ-00005 in review needs to go forward without a major addition to incorporate guidance

for maintianing the reactor critical in MODE 2-descending. The revision currently in review is needed for the refueling outage and its issuance should not be delayed. Maintaining the reactor critical in MODE 2-descending is a Forced Outage Concern.

The following should be addressed prior to closing this CARS:

1. Currently there is a desire to perform OSP-AC-00005, Turbine Actual Overspeed Trip - IPTE, during the RF15 shutdown. There is no requirement in the Acceptance Criteria, Precautions and Limitations, or Prerequisites for the reactor to remain critical during the performance of this test. In order to support performance of OSP-AC-00005 early in RF15, recommend the following:
    - Engineering verify decay heat and Reactor Coolant Pump heat will provide sufficient steam generation for performance of OSP-AC-00005 and schedule OSP-AC-00005 to be performed in MODE 3 after the rod insertion and during the boration to Cold Shutdown concentrations
    - If Engineering determines the reactor must remain critical during the performance of OSP-AC-00005, develop a strategy to perform OSP-AC-00005 low in MODE 1 where reactor power generation is sufficiently above the Point of Adding Heat that temperature/reactivity feedback can assist the operator in maintaining the reactor critical.
2. Following RF15, recommend a team be formed comprising Operators and Reactor Engineers to develop a proceduralized strategy for maintaining the reactor critical in MODE 2-descending. This strategy should be proceduralized as an addendum to OTG-ZZ-00005 and should be issued early in cycle 16. The addendum should provide guidance for the following:
    - The need to trip the turbine in low MODE 1 (around 8% power)
    - Guidance for setting the steam dumps below 1092 psig
    - The need to maintain reactor power greater than pump heat generation and decay heat generation to ensure temperature feedback is present while in MODE 2
    - The means used to monitor the decay of and detect the loss of temperature feedback (reaching the Point of Adding Heat)
    - If reactor power drops below the POAH, provide the process for determining when reactor power can be recovered and when the reactor must be shut down
    - The use of a plant computer "Group Display Large Group" which displays critical parameters for MODE 2-descending such as Start Up Rate, Intermediate Range NI power, auctioneered high delta T power
    - A rod movement strategy during the downpower which will ensure control rods are at a height of maximum effectiveness to both keep up with Xenon prior to dilution water taking affect to prevent entry into MODE 3 AND to add negative reactivity as needed so excess water can be added without entering MODE 1.
    - A strategy for controlling steam dumps in steam pressure mode. Control Rods and dilution should be used to maintain temperature around 557°F and steam dump setting should be adjusted to maintain steam demand greater than pump and decay heat (requiring the reactor to be above the POAH).
    - A MWe point during the downpower at which to stabilize for a specified minimum time in order to get an accurate analysis of Xenon (i.e. re-do the Xenon predict with the **actual** power history from the downpower) and to brief the dilution plan prior to tripping the turbine (stabilizing power should only be required when MODE 2-descending will be maintained - there is no need to require any hold points when MODE 2 will only be transitted through on the way to MODE 3).

Reactor Operators and Reactor Engineers should be involved with the development of this procedure from initial table top discussion through simulator validation.

Document Immediate Actions Taken in the Immediate Actions Box below

Immediate Actions

None required. This is a legacy issue.

Lead Response

Problem Statement:

No guidance exists for stabilizing the plant following a rapid load reduction to low power conditions.

Remedial Actions Taken:

1. OTG-ZZ-00005 and OTG-ZZ-00003 were revised to require a Reactivity Plan when power is to be maintained below

10%. When required, the Reactivity Plan will be developed in accordance with the guidelines contained in INPO-SER 06-06.

Extent of Condition:

This condition applies to operation of the plant at power levels in Mode 2 and low Mode 1. The team investigating past shutdowns evaluated all shutdowns referenced in this CAR. All issues have been resolved.

Results of Lower Tier Cause Evaluation (LTCE):

1. **Inadequate procedural guidance**: Procedures utilized did not contain adequate guidance for low power operations and in some instances contained requirements to level/hold power at low levels to take data while shutting down and susceptible to appreciable xenon transients.
2. **Unfamiliarity/poor preparation**: No Reactivity Management plan was utilized for low power operations. Therefore, operators who performed the evolution did not have the opportunity to practice the evolution utilizing the most effective/efficient reactivity management methods.

Corrective Actions:

The reactivity team has established an operating threshold of 20%. Operation below this power will require the actions detailed below. ODP-ZZ-00001 Add 10, Reactivity Management, OTG-ZZ-00004, Power Operation, and OTO-MA-00008, Rapid Load Reduction will be revised to incorporate the following corrective actions.

CA1: If power is to be held below 20% for greater than 30 minutes, a reactivity management plan must be provided by Reactor Engineering.

CA2: The crew performing the load reduction and power hold must conduct Pre-Evolution Practice (PrEP) utilizing the provided Reactivity Plan.

EN3: A dedicated SRO, not assigned CRS duties, will serve as Reactivity Monitor until a stable power level is reached and reactivity is changing less than 50 pcm per hour.
Update 8/20/07 during the August RMRC, this corrective action was determined to be an enhancement to prevent the type of occurrences described in this CAR. This was also identified as an item to be addressed under SOER 07-1, which will be addressed under CAR 200707507. This enhancement was placed as an action into CAR 200707507.

Guidance will be included to direct a Reactor Shutdown if the above conditions can not be met.

Additionally, training will be provided to the operating crews covering the new procedure guidance and the reasons for it. TRRQ 200702680 and 200702597 have been generated to request training on the OE gained from low power operations.

Justification if no Corrective Action was taken

EN3: Update 8/20/07 during the August RMRC, this corrective action was determined to be an enhancement to prevent the type of occurrences described in this CAR. This was also identified as an item to be addressed under SOER 07-1, which will be addressed under CAR 200707507. This enhancement will not be implemented under this CAR but instead will be placed as an action into CAR 200707507, to ensure recommendations are consistent to the SOER 97-1.

Closure Statement:
Statement indicating all actions have been completed.

Justification for due date extension from 2007-08-17 to 2007-10-17: This extension was approved by J. Weekley due to a newly issued SOER 07-01 issued Aug. 10th 2007 and recorded in CAR 200707507 to ensure recommendations in the SOER are consistent with the changes recommended in as corrective action.

Screening Worksheet

Performance Code	*Significance*	***Committee:***	*ORC*	*SAFE*	*PARC*	*CARB*	*MREP*
SI	3		False	False	False	True	False

Evaluations:	*MER*	*MCR*	*9MR*	***Closures:***	*Noted*	*Admin Close*
	True	True	False		False	False

Dispositions:	*MR*	*MSPI*	*MRA1*	*Repo*	*Trans*	*NMR*	*Oper*	*ASME*	*OOTR*	*PHPE*	*EPE*	*CCE*	*RWRK*	*PROC*
	False	False	False	False	False	False	False	False	False	False	False	False	False	False

Keywords

Keyword	*Description*
GP-OPS	Good Practice - Operations (Identified error precursors)
LCO	LCO
LETDOWN	LETDOWN - Flow into the Chemical Volume & Control System
PROCEDURE	PROCEDURE - A series of steps to be accomplished in a definite order
REACTIVITY MGMT	REACTIVITY MGMT - Reactivity management
RESCREEN	RESCREEN - CARS brought back to Screening Committee for re-evaluation
RF15 RVWD	MODE RESTRAINTE REVIEWED - CAP RESTRICTED USE
SHUTDOWN	SHUTDOWN - Shut down of the nuclear reactor/reaction
T/S	T/S - Technical Specification
TRANSIENT	TRANSIENT - Transient

Trend Codes

Trend Type	*Trend Code*	*Description*
Event Type	OE004BOR	BORATION OR DILUTION ISSUE
Activity	OP001PSD	PLANT SHUTDOWN (25% POWER TO MODE 3)
Cause	PR001NFO	INSUFFICIENT INFORMATION TO COMPLETE THE TASK

History

Type	*Description*	*User Pin*
H	Car Status changed from Initiate to Screening by Criscione, Lawrence (14827) on Feb 12 2007 4:35PM	14827
H	OPS Worksheet created by Bianco, Frederick (502) on Feb 13 2007 6:32AM	502
H	Car Lead changed from to Denny, Ricky (10232) by Biele, Rona (14532) on Feb 13 2007 11:28AM	14532
H	Car Status changed from Screening to Evaluate by Biele, Rona (14532) on Feb 13 2007 11:31AM	14532
H	Initial Action Release by Biele, Rona (14532) on Feb 13 2007 11:32AM	14532
H	Car Lead changed from Denny, Ricky (10232) to Weekley, John (6186) by Denny, Ricky (10232) on Mar 4 2007 9:16AM	10232
H	Car Lead changed from Weekley, John (6186) to Milligan, James (4002) by Weekley, John (6186) on Mar 4 2007 9:25AM	6186
H	Car Lead changed from Milligan, James (4002) to Denny, Ricky (10232) by Milligan, James (4002) on Mar 7 2007 7:21AM	4002
H	Car Lead changed from Denny, Ricky (10232) to Milligan, James (4002) by Milligan, James (4002) on Mar 7 2007 7:32AM	4002
H	Car Due Date changed from Mar 15 2007 12:00AM to May 15 2007 12:00AM by Milligan, James (4002) on Mar 15 2007 4:40PM	4002
H	Car Status changed from Evaluate to InProcess by Milligan, James (4002) on Mar 15 2007 4:43PM	4002
H	Car Status changed from InProcess to Evaluate by Daly, Mary (1386) on Mar 21 2007 1:49PM	1386
H	Car Status changed from Evaluate to Screening by Daly, Mary (1386) on Mar 21 2007 1:49PM	1386
H	Car Due Date changed from May 15 2007 12:00AM to Apr 19 2007 12:00AM by Haintel, Teresa (9862) on Mar 21 2007 1:55PM	9862

H	Car Status changed from Screening to Evaluate by Daly, Mary (1386) on Mar 21 2007 6:11PM	1386
H	Car Status changed from Evaluate to InProcess by Milligan, James (4002) on Mar 28 2007 12:01PM	4002
H	Car Due Date changed from Apr 19 2007 12:00AM to Jun 14 2007 12:00AM by Milligan, James (4002) on Apr 19 2007 5:36PM	4002
H	Car Due Date changed from Jun 14 2007 12:00AM to Jul 26 2007 12:00AM by Milligan, James (4002) on Jun 8 2007 4:26PM	4002
H	Car Lead changed from Milligan, James (4002) to Hopkins, David (2785) by Milligan, James (4002) on Jul 16 2007 2:21PM	4002
H	Car Lead changed from Hopkins, David (2785) to Milligan, James (4002) by Hopkins, David (2785) on Jul 23 2007 8:40AM	2785
H	Car Due Date changed from Jul 26 2007 12:00AM to Aug 17 2007 12:00AM by Weekley, John (6186) on Jul 25 2007 4:41PM	6186
H	Car Lead changed from Milligan, James (4002) to Criscione, Lawrence (14827) by Milligan, James (4002) on Aug 15 2007 6:03PM	4002
H	Car Due Date changed from Aug 17 2007 12:00AM to Oct 17 2007 12:00AM by Weekley, John (6186) on Aug 16 2007 3:26PM	6186
H	Car Lead changed from Criscione, Lawrence (14827) to Milligan, James (4002) by Milligan, James (4002) on Aug 20 2007 10:07AM	4002

Actions

1 - Vu, Hung (13296) - NESR - 90 - - 3/5/2007 - Eng verify decay heat and RCP heat will provide sufficient steam

2 - Weekley, John (6186) - O - 90 - MER - 4/4/2007 - Management Evaluation Review

3 - Winkler, Jo (10646) - PXIC - 90 - CARB - 8/17/2007 - CARB Committee evaluation assignment

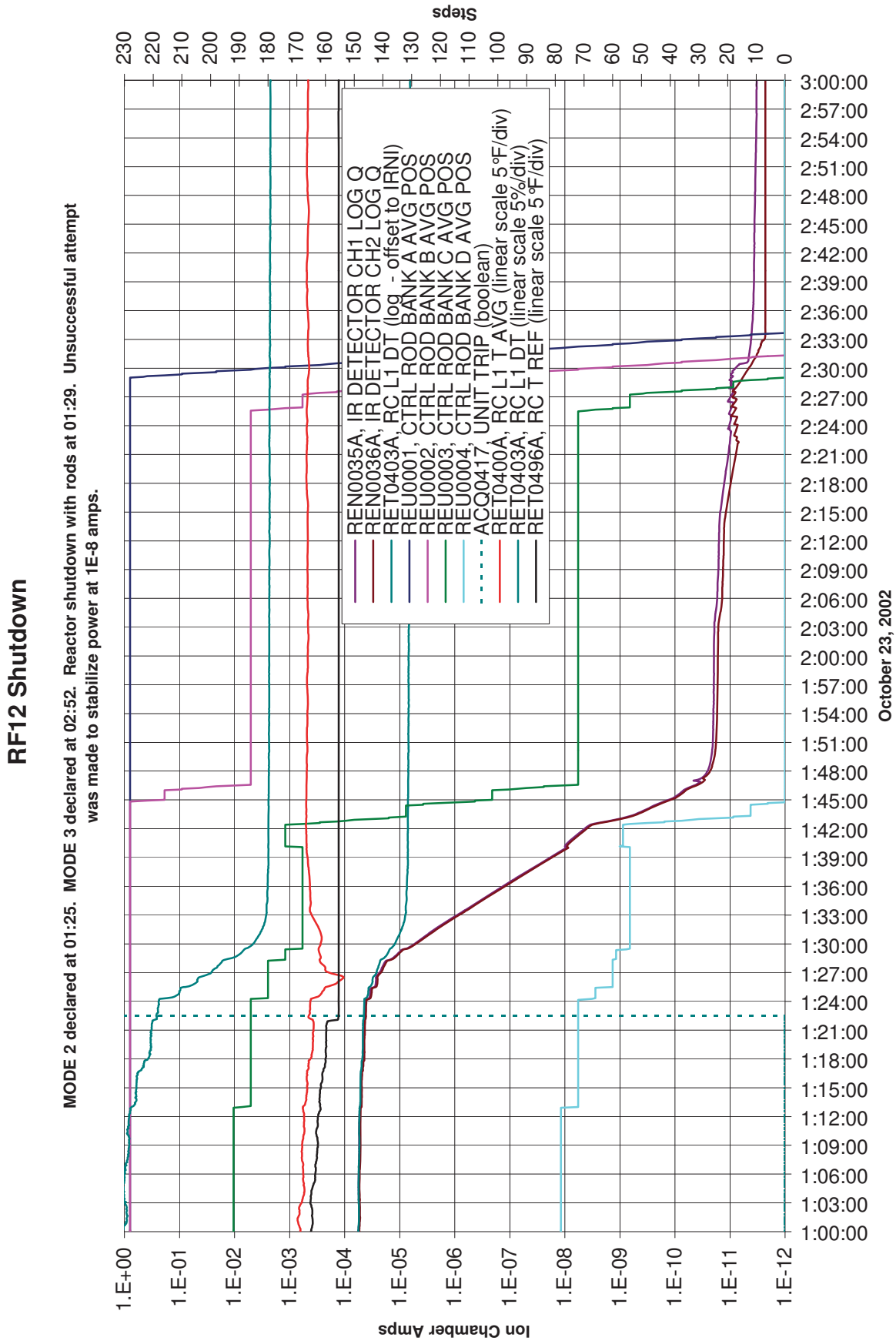
4 - Milligan, James (4002) - O - 90 - - 8/17/2007 - Team Meetings

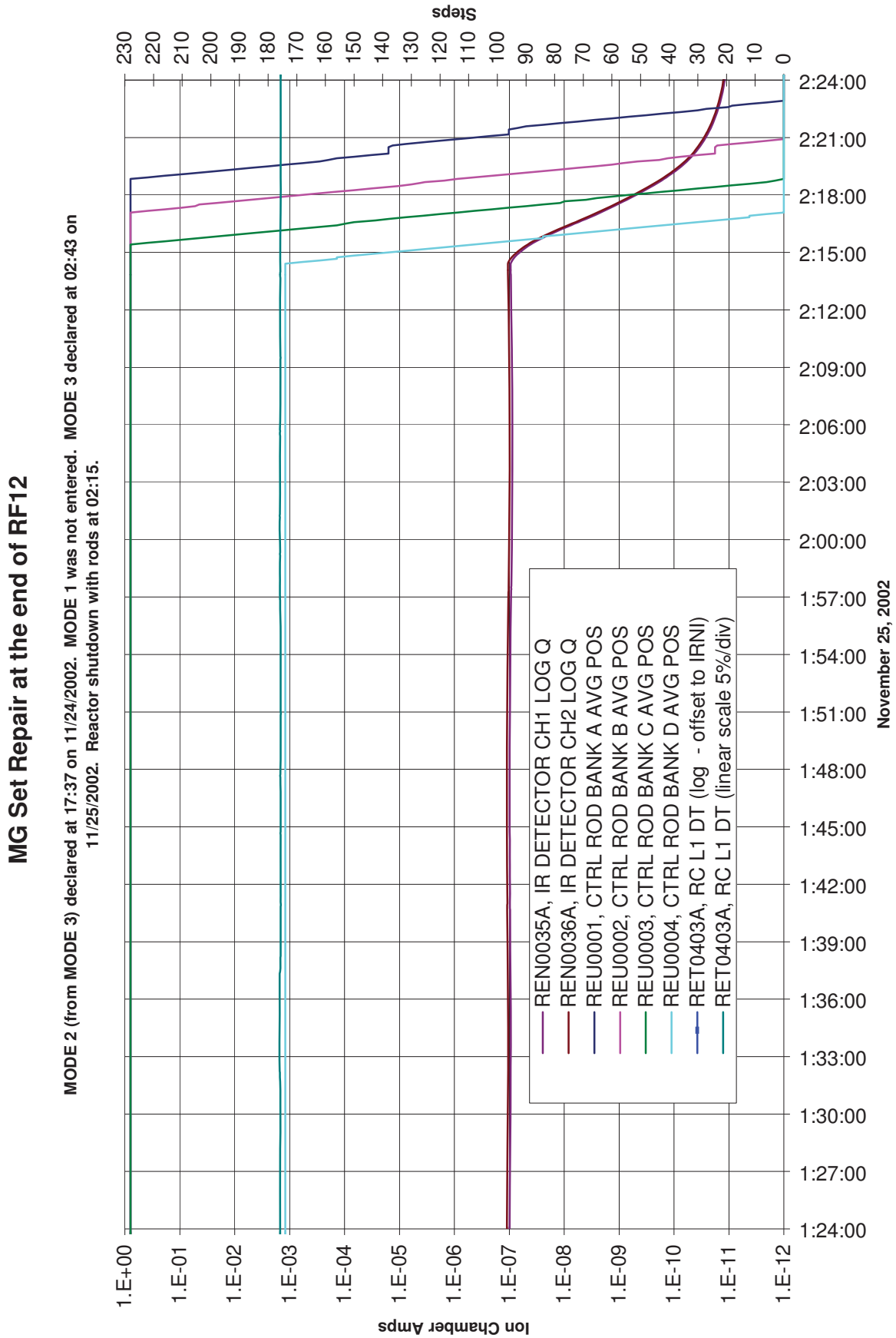
5 - Milligan, James (4002) - O - 90 - - 8/17/2007 - Document Extension History

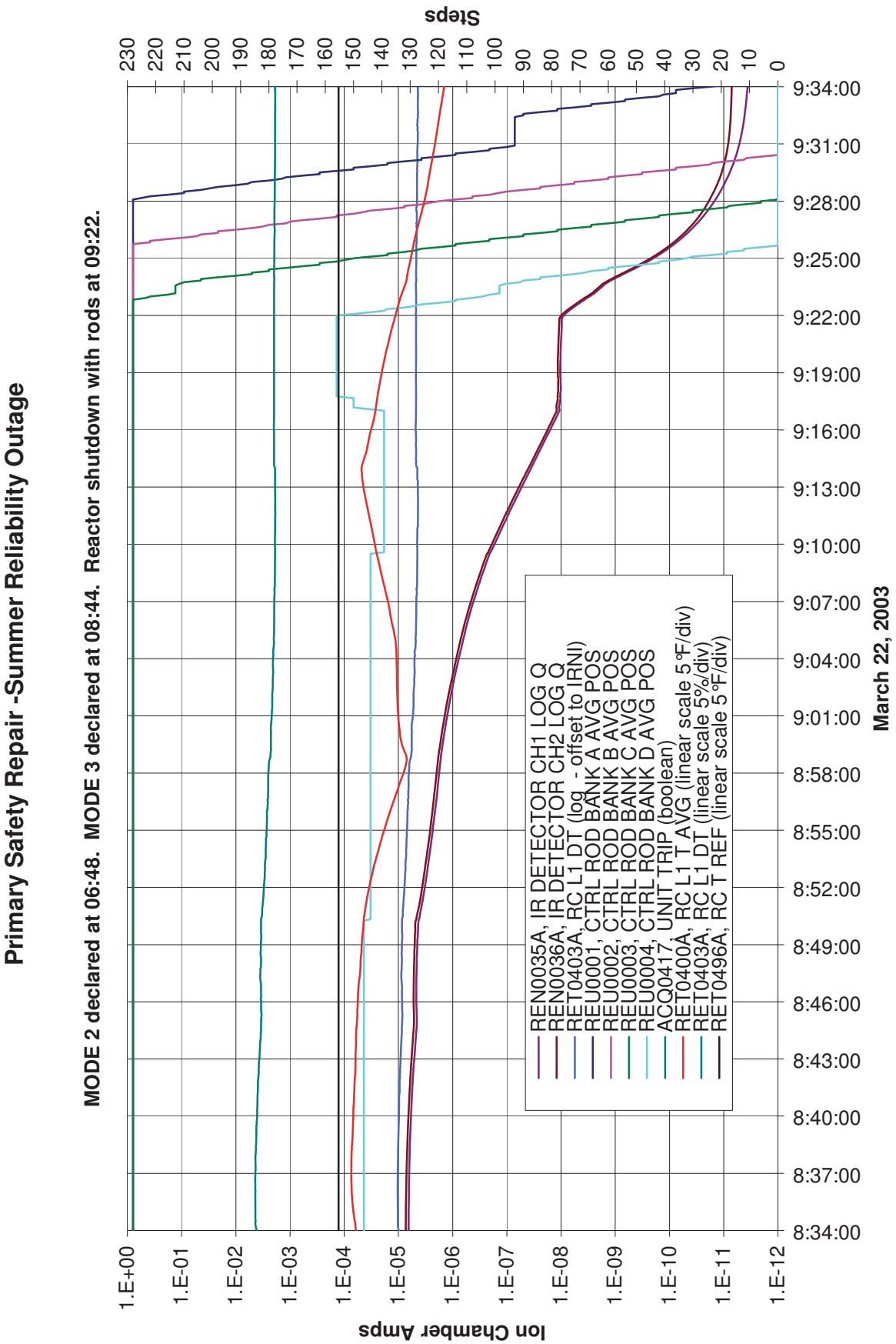
LogDate	Entry
10/21/2003 0:04	Completed ospse0004 sat. Calculated power 99.94%. No adjustment.
10/21/2003 0:37	Momentary loss of NN01 while attempting to transfer NN11 to its normal source. Entered OTO-NN-00001.
10/21/2003 0:40	Repositioned all rods to 228 steps and Bank D to 214.
10/21/2003 1:00	Commenced load decrease to Mode 3 per T.S. 3.8.7.A.
10/21/2003 1:18	Completed procedure OTO-NN-00001 LOSS OF SAFETY RELATED INSTRUMENT POWER Satisfactorily Exited OTONN00001..
10/21/2003 2:26	NFC procedure OSP-EF-0003A ST-07042 A UHS COOLING TOWER FAN TEST Satisfactorily .
10/21/2003 2:51	ATS procedure OSP-SE-00004 NIS POWER RANGE HEAT BALANCE. □ Reason□ Load Reduction for NN11 outage
10/21/2003 3:14	Placed NN11 on maintenance bypass to CVT.
10/21/2003 3:58	NFC procedure OSP-SE-00004 NIS POWER RANGE HEAT BALANCE Satisfactorily .
10/21/2003 5:00	ATS procedure OSP-SE-00004 NIS POWER RANGE HEAT BALANCE. □ Reason
10/21/2003 5:07	Assumed the SRO watch Under Instruction. W Gruer
10/21/2003 5:36	Relieved as SS by□ David Lantz Offgoing Stephen Sampson
10/21/2003 5:42	Relieved as CRS by Gerald Rauch Off-going Brian Price
10/21/2003 6:08	Completed procedure OSP-SE-00004 NIS POWER RANGE HEAT BALANCE Satisfactorily OSPSE00004 complete sat. Calculated power 51.25%. Adjusted all channels..
10/21/2003 6:14	NFC procedure OSP-SE-00004 NIS POWER RANGE HEAT BALANCE Satisfactorily .
10/21/2003 6:30	Relieved as FS by Kelly Alderman Off-going Frederick Bianco
10/21/2003 7:21	Entered T.S. 3.8.7.□ Complying with action statement B.□ Equipment taken out of service: None□ Reason: NN11. 6 Hours to Mode 3
10/21/2003 7:21	Entered T.S. 3.8.7.□ Complying with action statement B.□ Equipment taken out of service: None□ Reason: NN11. 36 Hours to Mode 5
10/21/2003 7:24	PAE01A, MAIN FEEDWATER PUMP A, stopped.
10/21/2003 7:58	NFC procedure OSP-GG-0001A ST-07043 'A' EMERG. EXH 10 HR RUN Satisfactorily .
10/21/2003 8:11	Precharge check for ABHV0011 Enter ODP-ZZ-00002 Actions for □ MSIV 64 hours (MSIV) Red Train
10/21/2003 8:14	PAD01A, CONDENSATE PUMP A, stopped.
10/21/2003 8:16	PDA2101B, CIRC WTR PMP B, stopped.
10/21/2003 8:21	Started procedure OTO-NN-00001 LOSS OF SAFETY RELATED INSTRUMENT POWER. □ Reason□ NN11
10/21/2003 8:33	ATS ST-13024 OSP-AL-00001 AFW VALVE ALIGNMENT
10/21/2003 9:10	PAF01A, HEATER DRAIN PUMP A, stopped.
10/21/2003 9:27	Exit ODP-ZZ-00002 actions for ABHV0011
10/21/2003 9:59	Started procedure OTO-BG-00001 LOSS OF LETDOWN. □ Reason
10/21/2003 10:04	PDE2001C, INTAKE PMP C, stopped.
10/21/2003 10:06	ATS ST-03566 ISF-BB-0P403 ISF-BB-0P403 - COT
10/21/2003 10:12	Tripped the Turbine
10/21/2003 10:13	Plant Mode Change from Mode 1□ to Mode 2□ Update plant Mode in the Safety Monitor Program - YES
10/21/2003 10:18	Completed procedure OTO-BG-00001 LOSS OF LETDOWN Satisfactorily .
10/21/2003 10:38	ATS ST-03533 ISF-SE-0N42B ISF-SE-0N42B - LO SETPT COT
10/21/2003 11:01	PAD01C, CONDENSATE PUMP C, stopped.
10/21/2003 11:13	NFC ST-03533 IDP-ZZ-00010 ISF-SE-0N42B - LO SETPT COT□ Sat□ Remarks
10/21/2003 11:14	ATS ST-03534 ISF-SE-0N43B ISF-SE-0N43B - LO SETPT COT
10/21/2003 11:34	NFC ST-13024 OSP-AL-00001 AFW VALVE ALIGNMENT□ Sat□ Remarks

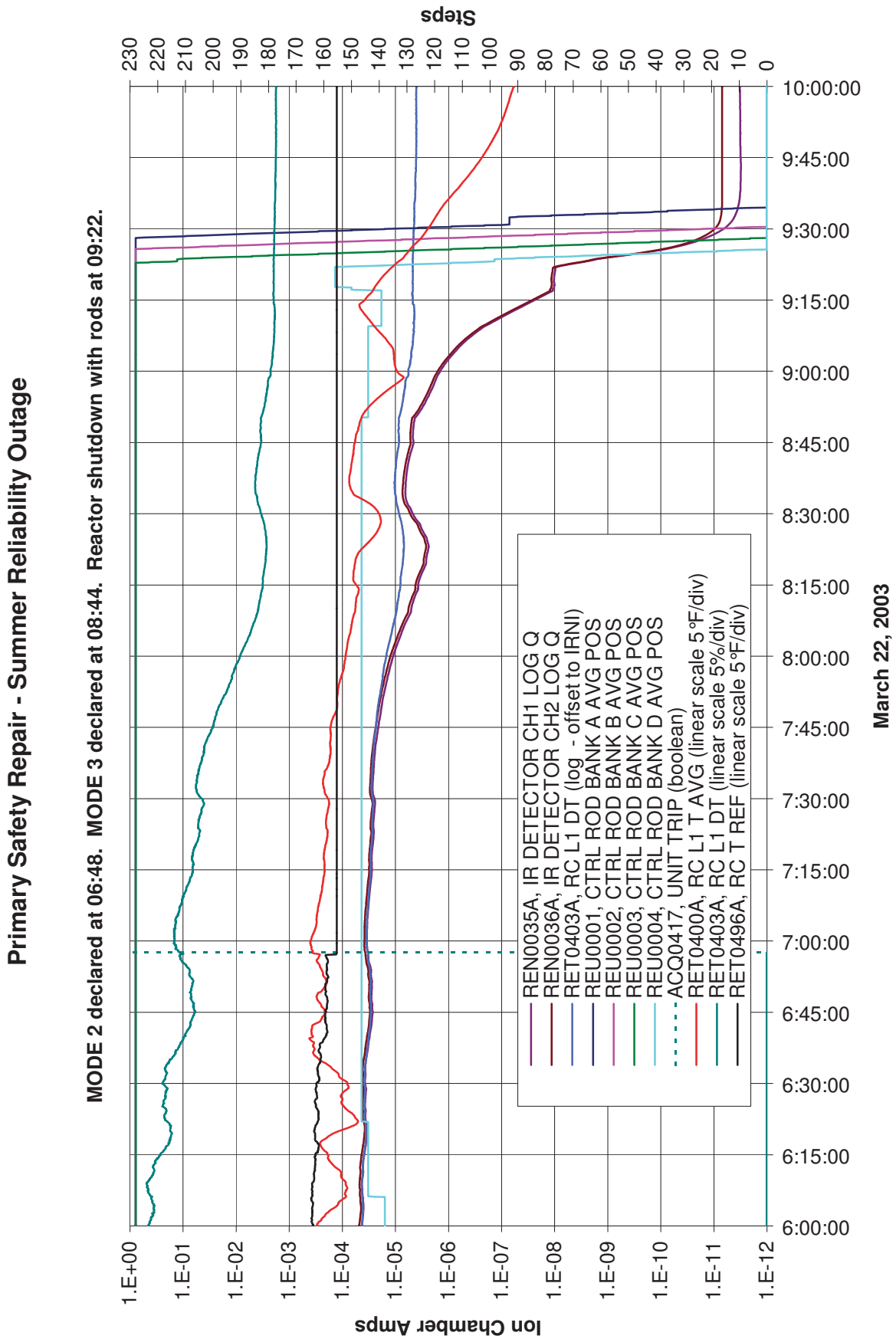
LogDate	Entry
10/21/2003 11:37	Completed procedure OTO-NN-00001 LOSS OF SAFETY RELATED INSTRUMENT POWER Satisfactorily .
10/21/2003 11:40	PAE02, STARTUP MAIN FEEDWATER PUMP, started.
10/21/2003 11:42	ATS procedure OSP-SF-00001 SHUTDOWN MARGIN CALCULATION. □
	Reason
10/21/2003 11:42	SGT02, CTMT MINI PURGE AIR SPLY UNIT, started.
10/21/2003 11:42	CGT02, CTMT MINI PURGE EXH FAN, started.
10/21/2003 11:44	NFC ST-03534 ISF-SE-0N43B ISF-SE-0N43B - LO SETPT COT□
	Sat□
	Remarks
10/21/2003 11:45	ATS ST-03535 ISF-SE-0N44B ISF-SE-0N44B - LO SETPT COT
10/21/2003 11:51	PAE01B, MAIN FEEDWATER PUMP B, stopped.
10/21/2003 12:12	NFC ST-03535 ISF-SE-0N44B ISF-SE-0N44B - LO SETPT COT□
	Sat□
	Remarks
10/21/2003 12:13	ATS ST-03532 ISF-SE-0N41B ISF-SE-0N41B - LO SETPT COT
10/21/2003 12:46	NFC ST-03532 ISF-SE-0N41B ISF-SE-0N41B - LO SETPT COT□
	Sat□
	Remarks
10/21/2003 12:47	ATS procedure ISF-SE-00N35 FCTNAL-NUC; NUC INSTM INTMD RNG N35. □
	Reason
10/21/2003 12:55	NFC procedure OSP-SF-00001 SHUTDOWN MARGIN CALCULATION Satisfactorily .
10/21/2003 12:55	Plant Mode Change from Mode 2□
	to Mode 3□
	Update plant Mode in the Safety Monitor Program - YES
10/21/2003 12:55	Exited Tech. Spec. 3.8.7.□
	Entered Mode 3 - Still in T.S. for Mode 5 in 36 hours.
10/21/2003 13:43	ATS ST-03121 OSP-BB-00006 RCS FLOW-MODE 3
10/21/2003 13:51	ATS procedure OSP-SA-00004 VISUAL INSPECTION OF CONTAINMENT FOR LOOSE DEBRIS. □
	Reason
10/21/2003 13:55	ATS procedure OSP-BB-00007 RCS HEATUP AND COOLDOWN LIMITATIONS. □
	Reason
10/21/2003 13:59	NFC procedure ISF-SE-00N35 FCTNAL-NUC; NUC INSTM INTMD RNG N35 Satisfactorily .
10/21/2003 13:59	ATS ST-03234 ISF-SE-00N36 ISF-SE-00N36 - COT
10/21/2003 14:15	NFC ST-03121 OSP-BB-00006 RCS FLOW-MODE 3□
	Sat□
	Remarks
10/21/2003 14:23	Relieved as FS by Dennis Catlett Off-going Kelly Alderman
10/21/2003 14:37	NFC ST-03234 ISF-SE-00N36 ISF-SE-00N36 - COT□
	Sat□
	Remarks
10/21/2003 14:45	Late Entry: Relieved as FS by Dennis Catlett Off-going Kelly Alderman
10/21/2003 15:31	SF52SF103B522, ROD DRIVE MG SET OUTPUT BREAKER B , Taken out of service.□
	Component is unavailable.□
	Reason:□
	Tripped
10/21/2003 16:59	ATS ST-03672 OSP-RP-00001 AUX SHTDN PNL SOURCE RANGE CHNL CK
10/21/2003 17:14	Secured the SRO watch Under Instruction. W Gruer
10/21/2003 17:58	Relieved as SS by□
	James Cunningham Offgoing David Lantz
10/21/2003 18:33	Commenced discharge of DMT A
10/21/2003 18:33	Verified Cooling Tower Bypass Flow at approximately 6K
10/21/2003 18:36	Relieved as BOP by Bryan Parker Off-going A. (Lee) Young
10/21/2003 18:40	Relieved as RO by James Keyes Off-going Elliot Qualls
10/21/2003 18:40	Begin the watch Mode 3 0 MWth, -0.1881071 MWe Rx Pwr % 0.0300041□
	RCS Boron, ppm 1248 Chg Flow, gpm 134.6477 L/D Flow, gpm 124.3772□
	Control Rod Position CB D - 0□
	Remarks source range counts 125
10/21/2003 18:55	ATS ST-00138, OSP-SB-C00001, RX TRIP BKR P-4 DATA
10/21/2003 19:45	Opened Reactor Trip Breakers.

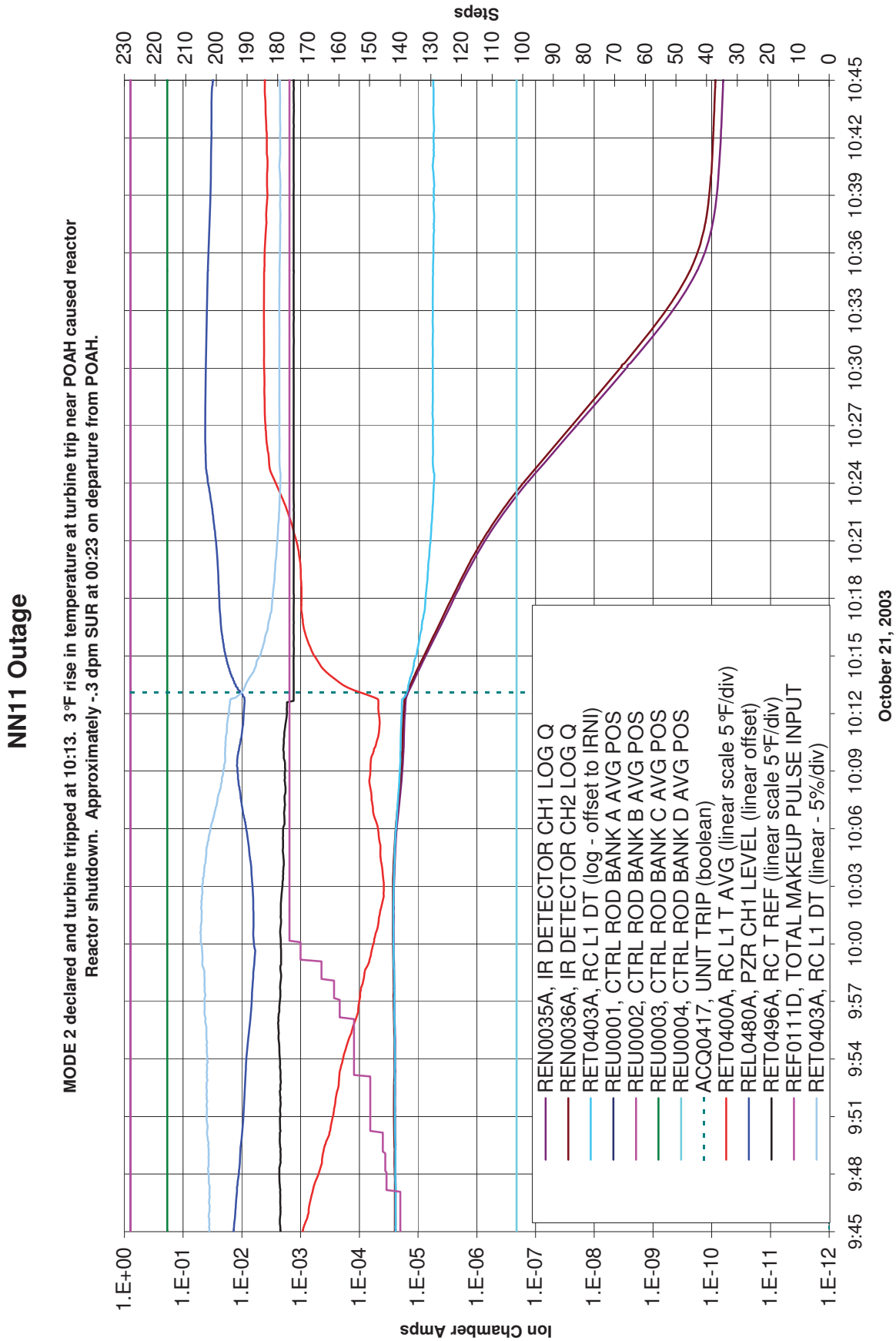
LogDate	Entry
10/21/2003 19:59	Verified P-4 Voltage at 0 volts
10/21/2003 20:04	Unblock SR Hi Flux At Shutdown per OTG-ZZ-00005 step 5.2.13.1
10/21/2003 20:18	Placed NN11 in service per OTN-NN-00001 section 4.6.2
10/21/2003 22:02	NN11 operable
10/21/2003 22:02	Exited Tech. Spec. LCO 3.8.7.□
	Reason: .
10/21/2003 22:02	Returned NN11, 7.5 KVA INV FED FROM NK0111, to service.
10/21/2003 22:02	Exited Tech. Spec. LCO 3.8.7.□
	Reason: NN11.
10/21/2003 22:30	Late Entry: DSM50, CTMT PERS ACCESS HATCH , Taken out of service.□
	Component is unavailable.□
	Reason:□
	Containment Entry
10/21/2003 22:30	Late Entry: Entered T.S. LCO 3.6.2.□
	Complying with action statement SR 3.6.2.1.□
	Equipment taken out of service: DSM50□
	Reason: .
10/21/2003 22:33	Verified Cooling Tower Bypass flow at 6K.
10/21/2003 22:40	Relieved as FS by Frederick Bianco Off-going Dennis Catlett
10/22/2003	QC reports steam leak on 'C' SG handhole.

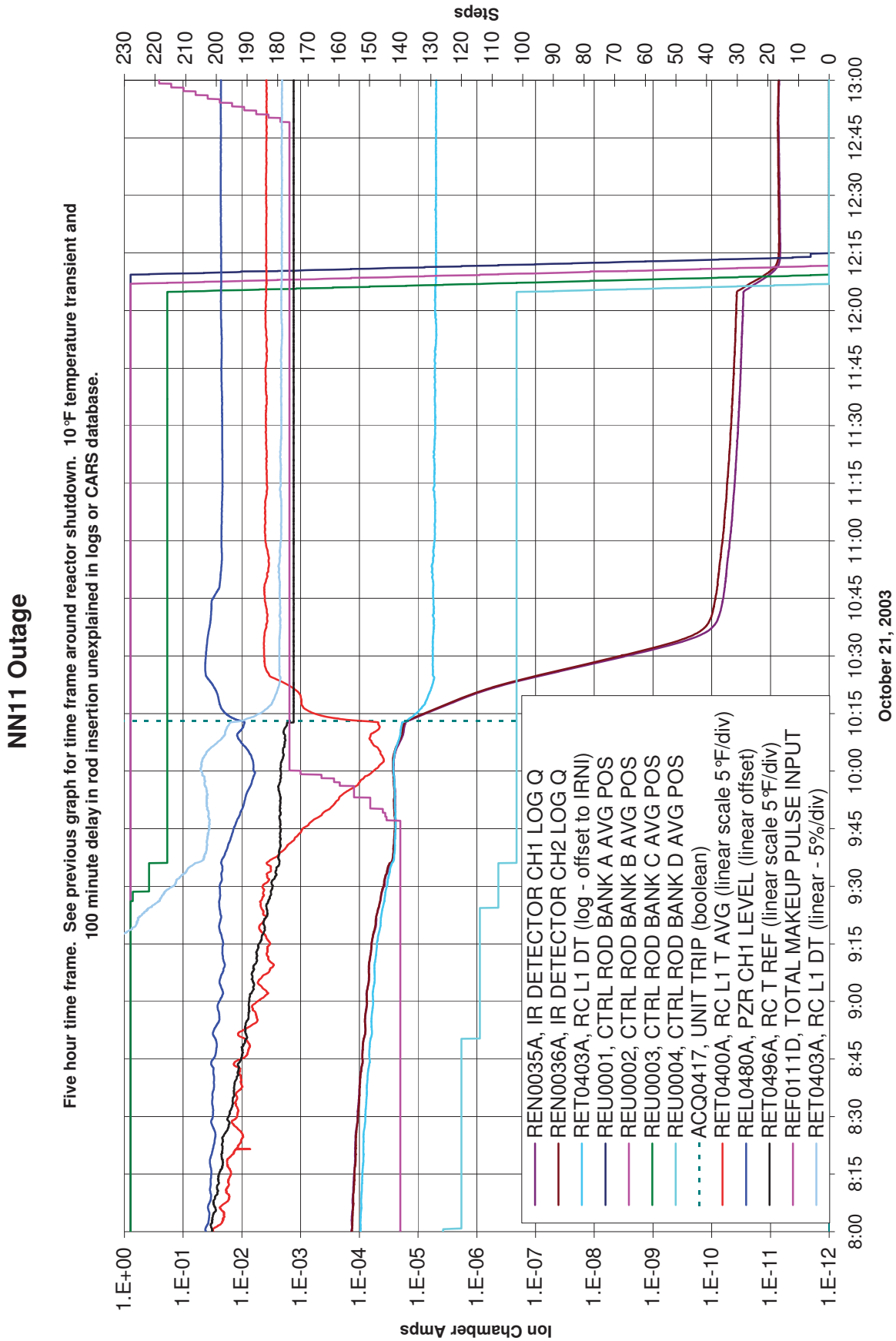

RF12 Shutdown
MODE 2 declared at 01:25. MODE 3 declared at 02:52. Reactor shutdown with rods at 01:29. Unsuccessful attempt was made to stabilize power at 1E-8 amps.
Steps
Ion Chamber Amps
October 23, 2002
REN0035A, IR DETECTOR CH1 LOG Q
REN0036A, IR DETECTOR CH2 LOG Q
RET0403A, RC L1 DT (log - offset to IRNI)
REU0001, CTRL ROD BANK A AVG POS
REU0002, CTRL ROD BANK B AVG POS
REU0003, CTRL ROD BANK C AVG POS
REU0004, CTRL ROD BANK D AVG POS
ACQ0417, UNIT TRIP (boolean)
RET0400A, RC L1 T AVG (linear scale 5°F/div)
RET0403A, RC L1 DT (linear scale 5%/div)
RET0496A, RC T REF (linear scale 5°F/div)

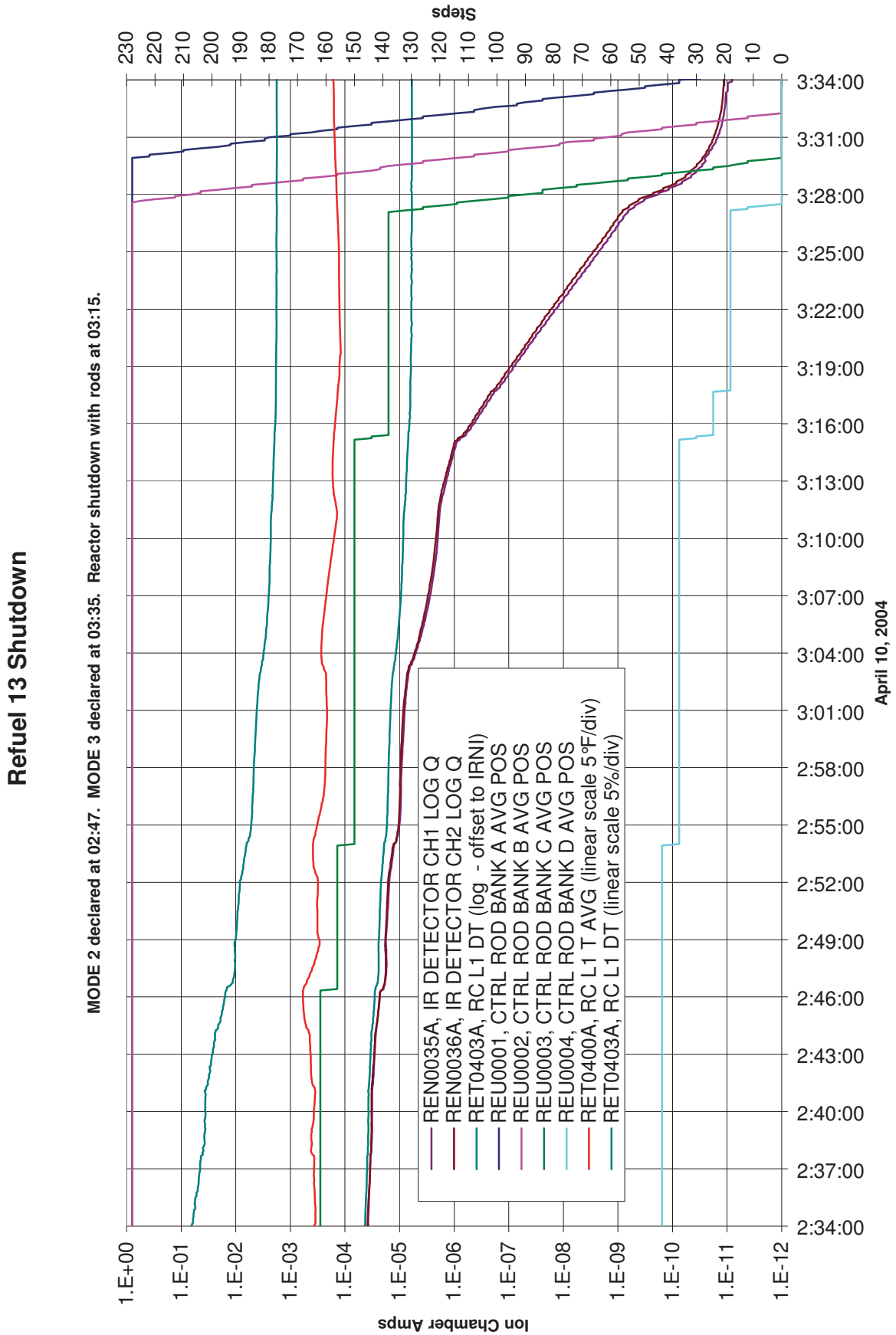

MG Set Repair at the end of RF12
MODE 2 (from MODE 3) declared at 17:37 on 11/24/2002. MODE 1 was not entered. MODE 3 declared at 02:43 on 11/25/2002. Reactor shutdown with rods at 02:15.
Steps
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Ion Chamber Amps
1.E+00
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
1.E-06
1.E-07
1.E-08
1.E-09
1.E-10
1.E-11
1.E-12
2:24:00
2:21:00
2:18:00
2:15:00
2:12:00
2:09:00
2:06:00
2:03:00
2:00:00
1:57:00
1:54:00
1:51:00
1:48:00
1:45:00
1:42:00
1:39:00
1:36:00
1:33:00
1:30:00
1:27:00
1:24:00
November 25, 2002
REN0035A, IR DETECTOR CH1 LOG Q
REN0036A, IR DETECTOR CH2 LOG Q
REU0001, CTRL ROD BANK A AVG POS
REU0002, CTRL ROD BANK B AVG POS
REU0003, CTRL ROD BANK C AVG POS
REU0004, CTRL ROD BANK D AVG POS
RET0403A, RC L1 DT (log - offset to IRNI)
RET0403A, RC L1 DT (linear scale 5%/div)

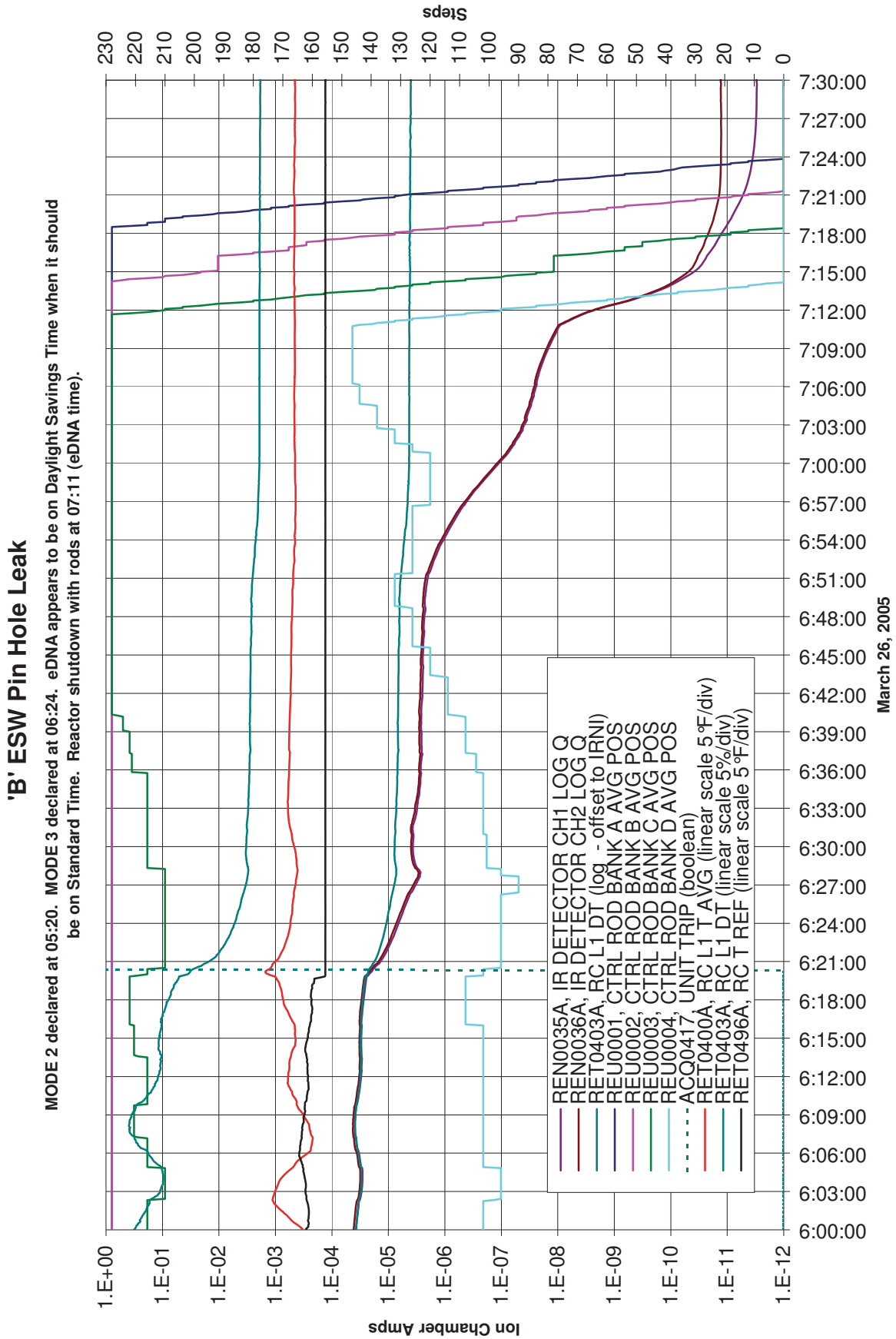

Primary Safety Repair -Summer Reliability Outage
MODE 2 declared at 06:48. MODE 3 declared at 08:44. Reactor shutdown with rods at 09:22.
Steps
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
9:34:00
9:31:00
9:28:00
9:25:00
9:22:00
9:19:00
9:16:00
9:13:00
9:10:00
9:07:00
9:04:00
9:01:00
8:58:00
8:55:00
8:52:00
8:49:00
8:46:00
8:43:00
8:40:00
8:37:00
8:34:00
March 22, 2003
Ion Chamber Amps
1.E+00
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
1.E-06
1.E-07
1.E-08
1.E-09
1.E-10
1.E-11
1.E-12
REN0035A, IR DETECTOR CH1 LOG Q
REN0036A, IR DETECTOR CH2 LOG Q
RET0403A, RC L1 DT (log - offset to IRNI)
REU0001, CTRL ROD BANK A AVG POS
REU0002, CTRL ROD BANK B AVG POS
REU0003, CTRL ROD BANK C AVG POS
REU0004, CTRL ROD BANK D AVG POS
ACQ0417, UNIT TRIP (boolean)
RET0400A, RC L1 T AVG (linear scale 5 ºF/div)
RET0403A, RC L1 DT (linear scale 5%/div)
RET0496A, RC T REF (linear scale 5 ºF/div)

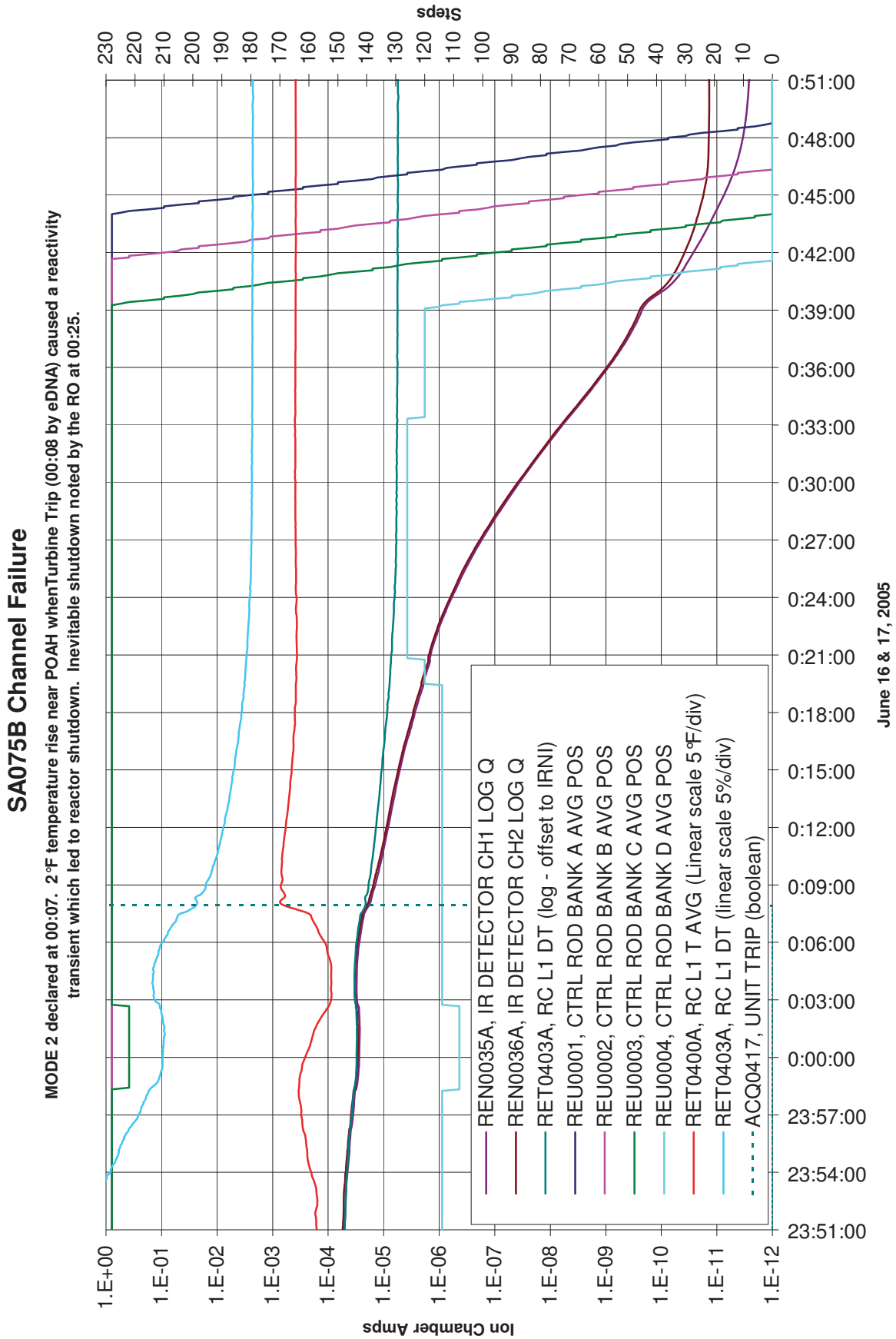

Primary Safety Repair - Summer Reliability Outage
MODE 2 declared at 06:48. MODE 3 declared at 08:44. Reactor shutdown with rods at 09:22.
Steps
Ion Chamber Amps
March 22, 2003
REN0035A, IR DETECTOR CH1 LOG Q
REN0036A, IR DETECTOR CH2 LOG Q
RET0403A, RC L1 DT (log - offset to IRNI)
REU0001, CTRL ROD BANK A AVG POS
REU0002, CTRL ROD BANK B AVG POS
REU0003, CTRL ROD BANK C AVG POS
REU0004, CTRL ROD BANK D AVG POS
ACQ0417, UNIT TRIP (boolean)
RET0400A, RC L1 T AVG (linear scale 5 °F/div)
RET0403A, RC L1 DT (linear scale 5%/div)
RET0496A, RC T REF (linear scale 5 °F/div)

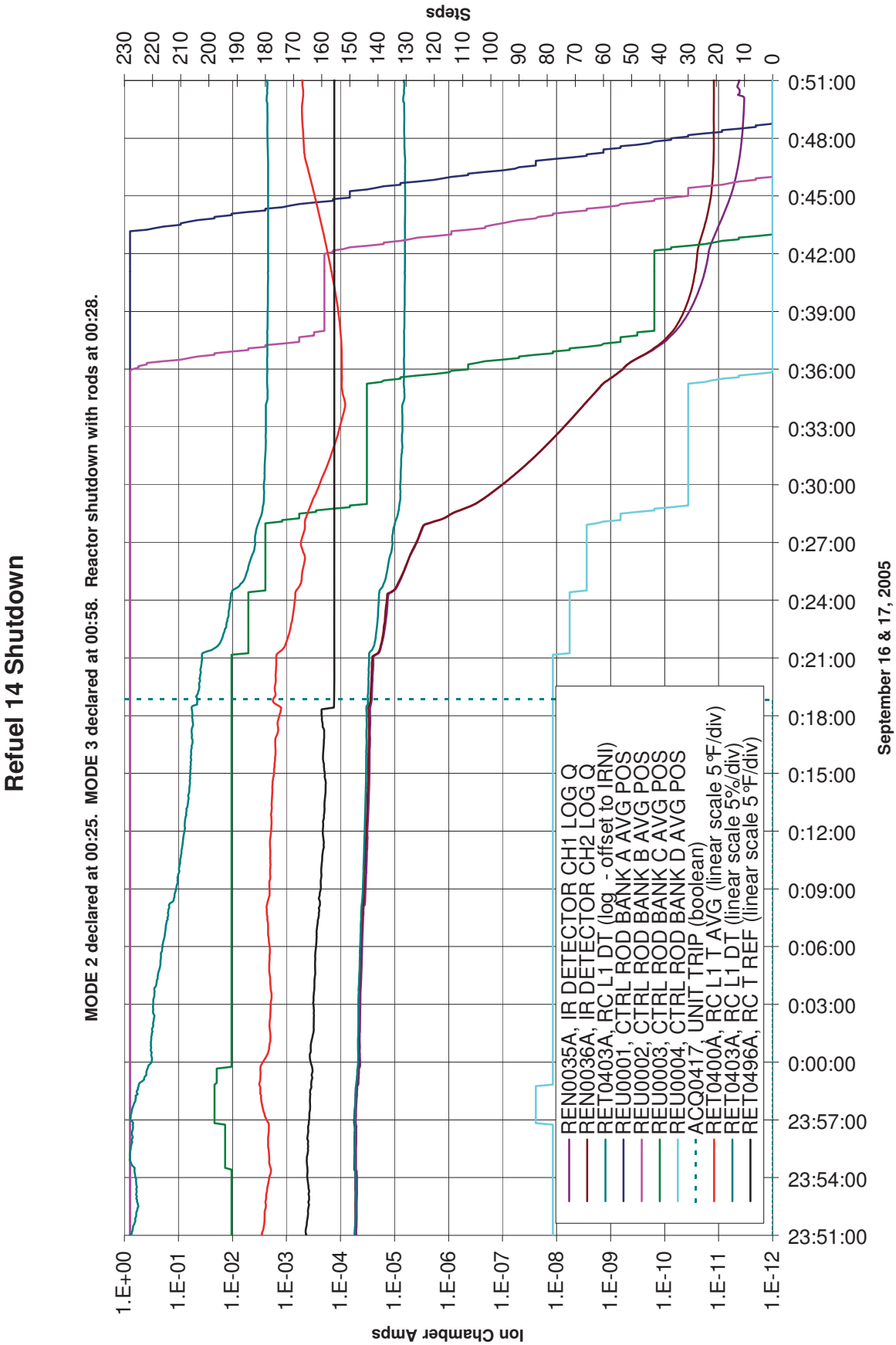

NN11 Outage
MODE 2 declared and turbine tripped at 10:13. 3°F rise in temperature at turbine trip near POAH caused reactor
Reactor shutdown. Approximately -.3 dpm SUR at 00:23 on departure from POAH.
Steps
Ion Chamber Amps
October 21, 2003
REN0035A, IR DETECTOR CH1 LOG Q
REN0036A, IR DETECTOR CH2 LOG Q
RET0403A, RC L1 DT (log - offset to IRNI)
REU0001, CTRL ROD BANK A AVG POS
REU0002, CTRL ROD BANK B AVG POS
REU0003, CTRL ROD BANK C AVG POS
REU0004, CTRL ROD BANK D AVG POS
ACQ0417, UNIT TRIP (boolean)
RET0400A, RC L1 T AVG (linear scale 5°F/div)
REL0480A, PZR CH1 LEVEL (linear offset)
RET0496A, RC T REF (linear scale 5°F/div)
REF0111D, TOTAL MAKEUP PULSE INPUT
RET0403A, RC L1 DT (linear - 5%/div)

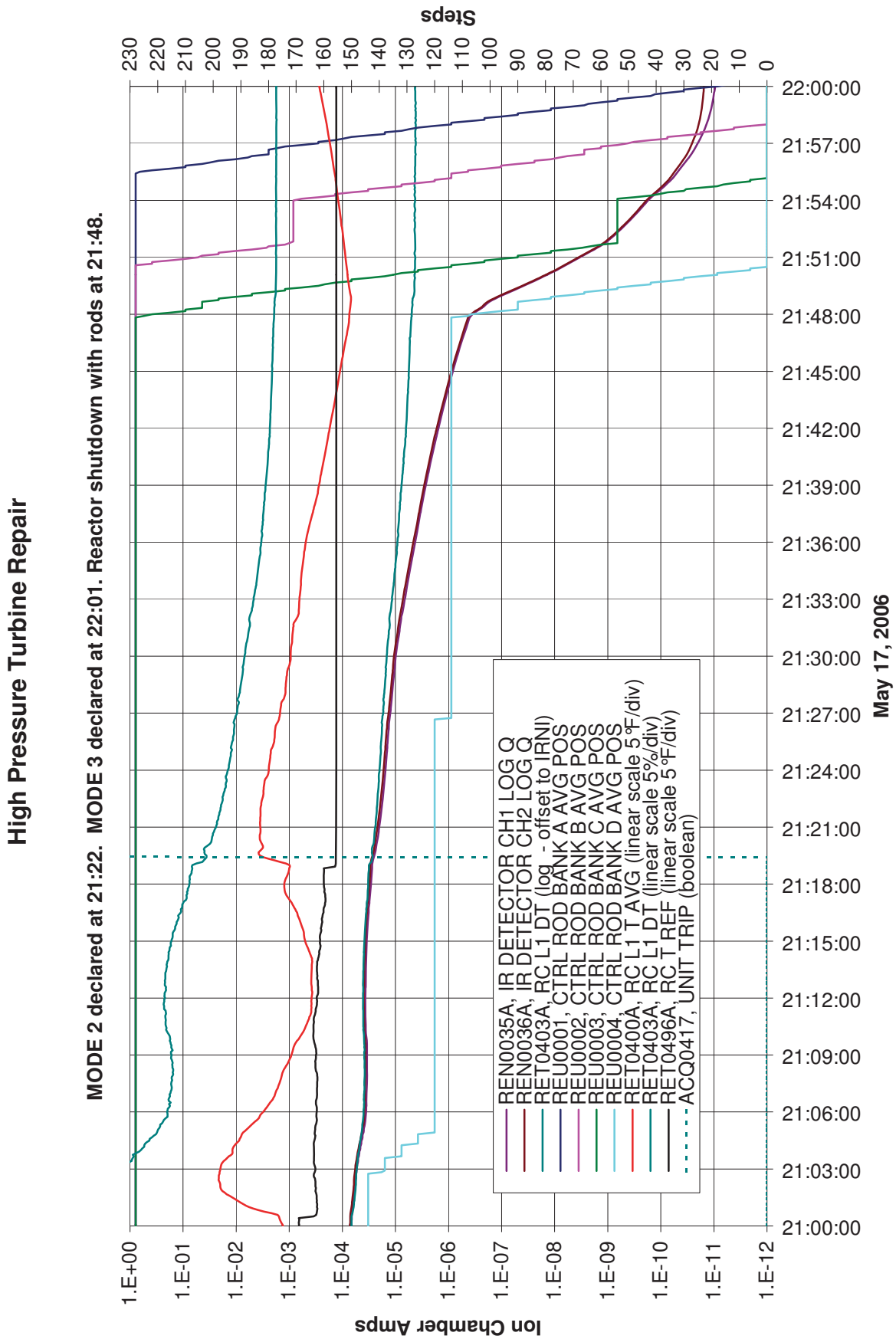

NN11 Outage
Five hour time frame. See previous graph for time frame around reactor shutdown. 10 °F temperature transient and 100 minute delay in rod insertion unexplained in logs or CARS database.
Steps
Ion Chamber Amps
October 21, 2003
REN0035A, IR DETECTOR CH1 LOG Q
REN0036A, IR DETECTOR CH2 LOG Q
RET0403A, RC L1 DT (log - offset to IRNI)
REU0001, CTRL ROD BANK A AVG POS
REU0002, CTRL ROD BANK B AVG POS
REU0003, CTRL ROD BANK C AVG POS
REU0004, CTRL ROD BANK D AVG POS
ACQ0417, UNIT TRIP (boolean)
RET0400A, RC L1 T AVG (linear scale 5 °F/div)
REL0480A, PZR CH1 LEVEL (linear offset)
RET0496A, RC T REF (linear scale 5 °F/div)
REF0111D, TOTAL MAKEUP PULSE INPUT
RET0403A, RC L1 DT (linear - 5%/div)

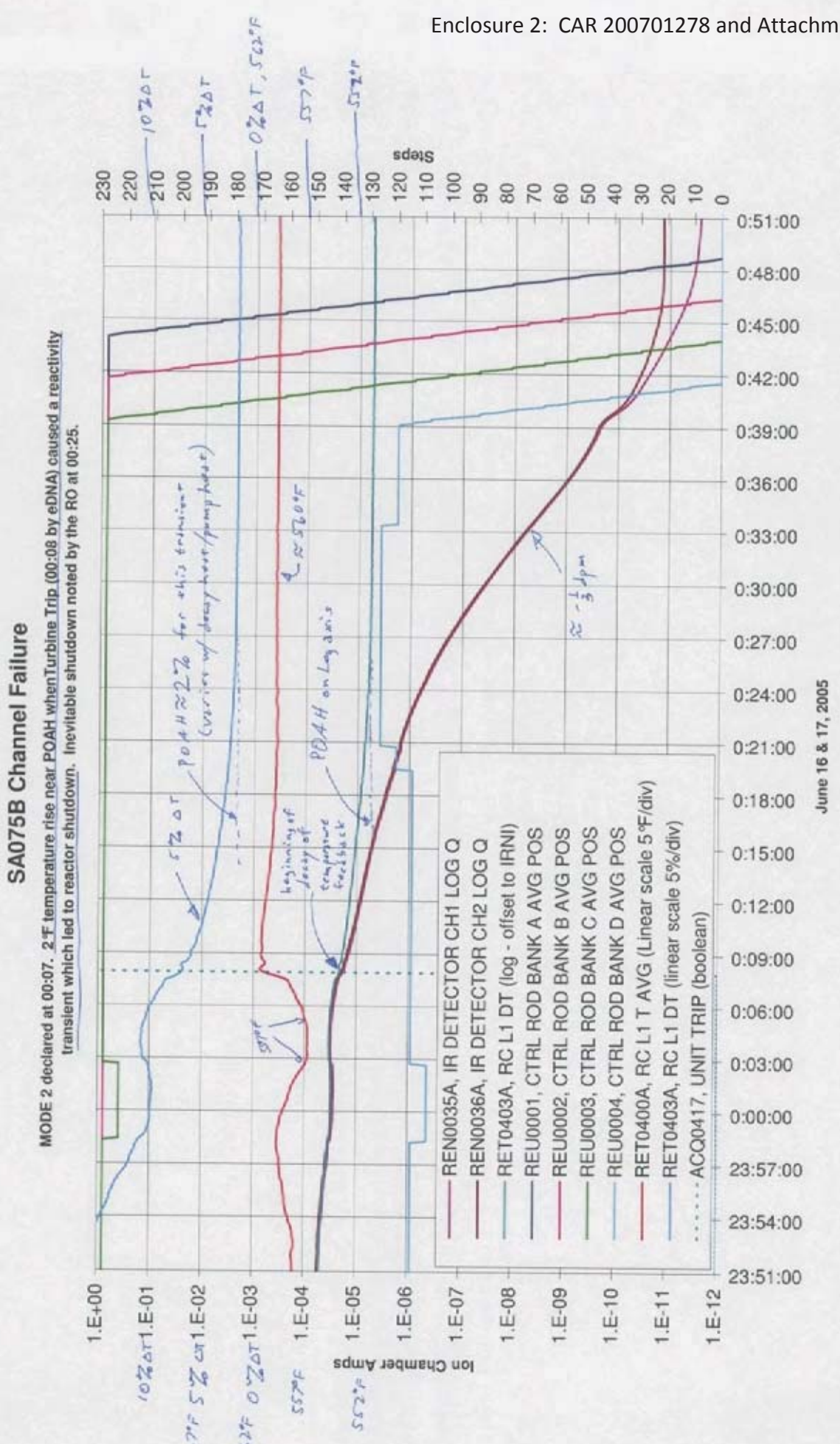

Refuel 13 Shutdown
MODE 2 declared at 02:47. MODE 3 declared at 03:35. Reactor shutdown with rods at 03:15.
Steps
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Ion Chamber Amps
1.E+00
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
1.E-06
1.E-07
1.E-08
1.E-09
1.E-10
1.E-11
1.E-12
3:34:00
3:31:00
3:28:00
3:25:00
3:22:00
3:19:00
3:16:00
3:13:00
3:10:00
3:07:00
3:04:00
3:01:00
2:58:00
2:55:00
2:52:00
2:49:00
2:46:00
2:43:00
2:40:00
2:37:00
2:34:00
April 10, 2004
REN0035A, IR DETECTOR CH1 LOG Q
REN0036A, IR DETECTOR CH2 LOG Q
RET0403A, RC L1 DT (log - offset to IRNI)
REU0001, CTRL ROD BANK A AVG POS
REU0002, CTRL ROD BANK B AVG POS
REU0003, CTRL ROD BANK C AVG POS
REU0004, CTRL ROD BANK D AVG POS
RET0400A, RC L1 T AVG (linear scale 5°F/div)
RET0403A, RC L1 DT (linear scale 5%/div)


'B' ESW Pin Hole Leak
MODE 2 declared at 05:20. MODE 3 declared at 06:24. eDNA appears to be on Daylight Savings Time when it should be on Standard Time. Reactor shutdown with rods at 07:11 (eDNA time).
Steps
Ion Chamber Amps
March 26, 2005
REN0035A, IR DETECTOR CH1 LOG Q
REN0036A, IR DETECTOR CH2 LOG Q
RET0403A, RC L1 DT (log - offset to IRNI)
REU0001, CTRL ROD BANK A AVG POS
REU0002, CTRL ROD BANK B AVG POS
REU0003, CTRL ROD BANK C AVG POS
REU0004, CTRL ROD BANK D AVG POS
ACQ0417, UNIT TRIP (boolean)
RET0400A, RC L1 T AVG (linear scale 5°F/div)
RET0403A, RC L1 DT (linear scale 5%/div)
RET0496A, RC T REF (linear scale 5°F/div)


SA075B Channel Failure
MODE 2 declared at 00:07. 2°F temperature rise near POAH whenTurbine Trip (00:08 by eDNA) caused a reactivity transient which led to reactor shutdown. Inevitable shutdown noted by the RO at 00:25.
June 16 & 17, 2005
Steps
Ion Chamber Amps
REN0035A, IR DETECTOR CH1 LOG Q
REN0036A, IR DETECTOR CH2 LOG Q
RET0403A, RC L1 DT (log - offset to IRNI)
REU0001, CTRL ROD BANK A AVG POS
REU0002, CTRL ROD BANK B AVG POS
REU0003, CTRL ROD BANK C AVG POS
REU0004, CTRL ROD BANK D AVG POS
RET0400A, RC L1 T AVG (Linear scale 5°F/div)
RET0403A, RC L1 DT (linear scale 5%/div)
ACQ0417, UNIT TRIP (boolean)


Refuel 14 Shutdown
MODE 2 declared at 00:25. MODE 3 declared at 00:58. Reactor shutdown with rods at 00:28.
Steps
Ion Chamber Amps
September 16 & 17, 2005
REN0035A, IR DETECTOR CH1 LOG Q
REN0036A, IR DETECTOR CH2 LOG Q
RET0403A, RC L1 DT (log - offset to IRNI)
REU0001, CTRL ROD BANK A AVG POS
REU0002, CTRL ROD BANK B AVG POS
REU0003, CTRL ROD BANK C AVG POS
REU0004, CTRL ROD BANK D AVG POS
ACQ00417, UNIT TRIP (boolean)
RET0400A, RC L1 T AVG (linear scale 5 °F/div)
RET0403A, RC L1 DT (linear scale 5%/div)
RET0496A, RC T REF (linear scale 5 °F/div)


High Pressure Turbine Repair
MODE 2 declared at 21:22. MODE 3 declared at 22:01. Reactor shutdown with rods at 21:48.
Steps
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Ion Chamber Amps
1.E+00
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
1.E-06
1.E-07
1.E-08
1.E-09
1.E-10
1.E-11
1.E-12
22:00:00
21:57:00
21:54:00
21:51:00
21:48:00
21:45:00
21:42:00
21:39:00
21:36:00
21:33:00
21:30:00
21:27:00
21:24:00
21:21:00
21:18:00
21:15:00
21:12:00
21:09:00
21:06:00
21:03:00
21:00:00
May 17, 2006
REN0035A, IR DETECTOR CH1 LOG Q
REN0036A, IR DETECTOR CH2 LOG Q
RET0403A, RC L1 DT (log - offset to IRNI)
REU0001, CTRL ROD BANK A AVG POS
REU0002, CTRL ROD BANK B AVG POS
REU0003, CTRL ROD BANK C AVG POS
REU0004, CTRL ROD BANK D AVG POS
RET0400A, RC L1 T AVG (linear scale 5 °F/div)
RET0403A, RC L1 DT (linear scale 5%/div)
RET0496A, RC T REF (linear scale 5 °F/div)
ACQ0417, UNIT TRIP (boolean)


SA075B Channel Failure
MODE 2 declared at 00:07. 2°F temperature rise near POAH when Turbine Trip (00:08 by eDNA) caused a reactivity transient which led to reactor shutdown. Inevitable shutdown noted by the RO at 00:25.
Steps
Ion Chamber Amps
June 16 & 17, 2005
REN0035A, IR DETECTOR CH1 LOG Q
REN0036A, IR DETECTOR CH2 LOG Q
RET0403A, RC L1 DT (log - offset to IRNI)
REU0001, CTRL ROD BANK A AVG POS
REU0002, CTRL ROD BANK B AVG POS
REU0003, CTRL ROD BANK C AVG POS
REU0004, CTRL ROD BANK D AVG POS
RET0400A, RC L1 T AVG (Linear scale 5°F/div)
RET0403A, RC L1 DT (linear scale 5%/div)
ACQ0417, UNIT TRIP (boolean)

From:	Lawrence Criscione
To:	elmo.collins@nrc.gov
Subject:	Background on Ameren"s response to the October 21, 2003 Passive Reactor Shutdown
Date:	Friday, June 03, 2011 1:24:09 AM
Attachments:	Accepted Updated CAR 200702606 (FadiLarry Criscione).msg Accepted CAR 200701278 (FMDLarry Criscione).msg Accepted CAR 200704913 (FMDLarry Criscione).msg Accepted Meet with Larry Criscione re CARS 200701278.msg Accepted Meeting with LSC.msg Feedback on CAR 200701278.msg CAR 200702606 investigation.msg

Elmo,

The email trail below shows the people at Ameren who, in 2007, were made well aware of the my concerns regarding the October 21, 2003 passive reactor shutdown.

I accidently came across the event in February 2007 and documented it in CAR 200701278. I attended the CAR Screening Committee meeting the day CAR 200701278 was screened in order to answer any questions. At the meeting, I protested when CAR 200701278 was screened as a Sig-4 meaning it did not require any investigation. I had several discussions with both the Operations and the Performance Improvement Departments in the days following the screening of CAR 200701278. These discussions occurred in people's cubicles/offices and I have no clean record of them. What I do have a record of is a February 22, 2007 meeting with Adam Heflin (then Site VP) regarding my concerns that CAR 200701278 needed to be at least a Sig 3 (requiring a Lower Tier Causal Examination) and preferably a Sig 1 or 2 (requiring a Root Cause Analysis). When Adam refused to help me, I took the issue to Michael Peck (NRC's SRI at Callaway) on March 2, 2007.

In March, I forced my way unto the agenda of the Reactivity Management Review Committee meeting and presented CAR 200701278. Following that meeting, Shift Manager Gary Olmstead wrote CAR 200702606 regarding the October 21, 2003 shutdown. After much debate, Gary's condition report was screened a sig-3 which then caused CAR 200701278 to likewise be re-screened to a Sig 3.

In early May 2007 I wrote CAR 200704911 regarding the propensity of Operations to not document significant transients. One of the incidents of concern was the October 21, 2003 passive reactor shutdown.

In mid May 2007 I discussed my concerns regarding the October 21, 2003 passive reactor shutdown with Quality Assurance and the Employee Concerns Program. These meetings were merely to make allegations – they were short (about an hour) and the technical details and facts were not delved into. Both QA and ECP supposedly conducted investigations of the incidents, but somehow did not see the need to interview me when it came to looking into the details. It is my belief that, like the NRC, these investigations were not concerned with getting at what happened as much as they were about justifying claims that reactor safety was never violated.

See the email entitled "Feedback of CAR 200701278". The email trail begins with a May 30, 2007 email entitled "Low Power Reactor Operation – Commercial Concern" which I sent to Chuck

Naslund (the then Chief Nuclear Officer) and copied to Adam Heflin, Dave Neterer, Fadi Diya and Tom Voss (Ameren's CEO).

On June 5 and June 13, 2007 I met with Fadi Diya to discuss my concerns regarding Operations' handling of CAR 200701278 (the June 5 invitation says "CAR 200704913" but the main topic of discussion was CAR 200704911 and CAR 200701278).

Over a three day period in June 2007, a team met to evaluate CAR 200701278. Similar to the mandate which Region IV gave John Kramer in 2009, the June 2007 team at Callaway was tasked with determining whether or not adequate solutions were in place and specifically avoided the examination of the details of past events.

Note that well before August 10, 2007 all levels of Ameren management were well aware of the October 21, 2003 and June 17, 2005 inadvertent passive reactor shutdowns (the Outlook documents attached to this email prove it). So when INPO requested utilities "*to provide information on similar occurrences and solutions at their plants or on their equipment to INPO Events Analysis*" in their August 10 cover letter distributing WANO SOER 07-1, *Reactivity Management*, Ameren was well aware that it had two such occurrences which it was expected to report. However, just as Ameren failed to adequately investigate and share the occurrences internally with their own licensed operators, they likewise failed to share the incidents externally with INPO.

On August 30, 2007 I submitted detailed feedback to Fadi Diya regarding the handling of CAR 200701278 (see attached email).

As can be seen from the email trail below, in October 2007 I brought my concerns again to Fadi Diya as well as to John Franz and Ellis Merschoff of Ameren's Nuclear Safety Review Board. In the November 13, 2007 email directly below, I bluntly state my concerns to Adam Heflin.

In our meeting last Friday (May 27) I had the impression that you believe the leadership of Ameren has changed out since the October 2003 shutdown. This is a MISPERCEPTION. Although there was a management change out in 2004, the individuals who were replaced (Warren Witt, Gary Randolf, Ron Affolter) had nothing to do with the October 21, 2003 passive shutdown and its cover up. These men knew nothing about it. They were whom it was covered up from. When the control rods were inserted on October 21, 2003 at 12:04 pm, Warren Witt, Ron Affolter, Gary Randolf and John Patterson (the EDO) were all under the impression that the control rods were being used to actively shut down the reactor – none of them were ever made aware that the reactor had actually passively shut down 106 minutes earlier and that at 12:04 pm the control rods were being inserted on a reactor that had been in the source range for 85 minutes. Dave Neterer (the then Operations Manager and the current Plant Director) was aware of the passive reactor shutdown – he was in the control room doing an observation at 11:25 when the channel 2 Source Range Nuclear Instrument unexpectedly energized. And he survived the 2004 house cleaning. Dave Lantz (the Shift Manager on October 21, 2003 and the current Operations Training Manager) also survived the house cleaning.

And although Fadi Diya and Adam Heflin were not present in 2003, they were both present in 2007 when the incident was uncovered. And as can be seen from the email trail below and from the attached documents, they have been made well aware of my concerns surrounding the incident, both before and after the August 10, 2007 request from INPO.

> *"A major flaw in our system of government, and even in industry, is the latitude allowed to do less than is necessary. Too often officials are willing to accept and adapt to situations they know to be wrong. The tendency is to downplay problems instead of actively trying to correct them."*

In your Region, you have a plant at which the upper most management is "*willing to accept and adapt to situations they know to be wrong*" and works to "*downplay problems instead of actively trying to correct them*." I don't know if you can accept this, but I know I cannot. It will take more than 30 pieces of silver and a $50,000 Sword of Damocles to convince me to stick my head in the sand.

The attached documents and the details in the paragraphs above are just the highlights. A detailed accounting of the incident and its mis-handling by both Ameren and the NRC can be found on one of Bill Corcoran's Yahoo Groups (RCSOTP_16_ReactivityControl@yahoogroups.com). Dr. Corcoran is a 1959 USNA graduate who does Root Cause consulting – mostly in the nuclear industry. He is assisting me with getting a group of root cause professionals to look at the October 21, 2003 passive reactor shutdown and how it was investigated internally by Ameren and externally by the US NRC. The ultimate goal is to write a root cause report that can be submitted to the Commission, the ACRS and possibly to the GAO (via a Congressman on the House Energy and Commerce Committee). Dr. Corcoran's site has a Comparative Time Line which details the significant events in the investigation of the transient and its cover up. This timeline would be useful to anyone at Region IV interested in understanding the details of the incident and Ameren's internal handling of it. Access to the site is freely granted by Dr. Corcoran to anyone sending an email to RCSTOP_16_ReactivityControl-subscribe@yahoogroups.com.

Our "Risk Informed" processes rely on honesty. We can never "Risk Inform" dishonesty. We need to address it the old fashion way – by objectively weighing all the facts and subjectively deciding how those facts sum up. I believe that if you objectively weigh the facts you will see that Dave Lantz was dishonest during his April 1, 2008 testimony and that Adam Heflin lies to you whenever he claims that Ameren is doing all that they can do to address this shutdown. Compare Ameren's handling of the October 2003 and June 2005 passive shutdowns with Surry's handling of their 2005 passive reactor shutdown and inadvertent restart. Neither the Callaway incidents nor the Surry incident were documented by the operators, but at Surry when the management found out they addressed the issue not only internally but with an INPO SEN to the entire industry – whereas Callaway has spent four years justifying why no detailed investigation need be performed.

I look forward to meeting with you again.

V/r,

Larry

Any one detail, followed through to its source, will usually reveal the general state of readiness of the whole organization.

From: Larry Criscione [mailto:LSCriscione@hotmail.com]
Sent: Tuesday, November 13, 2007 12:20 PM
To: aheflin@ameren.com
Cc: franzjfjr@aol.com; emerschoff@aol.com; golmstead@ameren.com; fdiya@ameren.com; ghughes@ameren.com; lkanuckel@ameren.com; wjessop@ameren.com; tsteele@ameren.com
Subject: Allegation RIV-2007-A-0028

Adam,

Allegation RIV-2007-A-0028 is the issue I wish to speak with you about before departing Callaway.

As you can see from the email trail below, I have unsuccessfully attempted to get this issue addressed at several levels of the Ameren organization, the US Nuclear Regulatory Commission and the staffs of members of congress.

On October 21, 2003 Callaway Plant was shutting down due to the expiration of a Technical Specification Limiting Condition of Operation for a failed safety related instrument bus inverter (NN11). Condition A of the LCO expired at 0721, leaving the crew six hours (until 1321) to either have the inverter restored or be in MODE 3. While in Condition B of the LCO (6 hours to shut down to MODE 3 and 36 hours to cool down to MODE 5), the NRC has allowed plants to remain critical as long as repairs to the equipment are progressing and they do not exceed the 6 hour limit. In the past (and still today) Callaway Plant has made use of this custom; while in the 6 hour window, the plant is placed in a condition where it can be readily shutdown but, as long as repair of the equipment appears possible prior to the expiration of the 6 hour window, the plant remains critical. This is what the expectation of the Plant Manager was on October 21, 2003.

Around 0938 on October 21, 2003 a secondary plant transient caused the crew to lose control of Reactor Coolant System temperature. RCS temperature dropped 10°F during the transient and exceeded the Minimum Temperature for Critical Operation for about 14 minutes. During this time, the crew tripped the turbine to mitigate the RCS temperature transient. Temperature rose 4°F over the next couple of minutes, resulting in an inadvertent reactor shutdown due to the negative reactivity inserted by the temperature rise. eDNA data indicates the plant shutdown around 1025.

Up until this point, I have no concerns with the crew's actions. Although their response to the temperature transient may not have been as timely as a more experienced crew's, their actions were appropriate nonetheless. However, for inexplicable reasons they did not document the transient in the Callaway Action Request System and failed to insert the control banks when they recognized the reactor had shutdown.

I believe the crew did not document the temperature transient because the Shift Manager, and possibly the Operations Manager, did not wish to draw attention to the event. There were some in Operations at the time (and, to some extent, currently) who viewed the documentation of operator errors in the CAR System negatively. Although they recognized it was an expectation that such errors should be documented, they did not recognize the true value of documenting and analyzing

mistakes. They did not recognize that documented mistakes were an opportunity from which the organization could learn valuable lessons; they instead viewed documented mistakes as instruments to bring unwanted scrutiny of the crew (and of the Operations Department) by upper management.

I have been told by Dave Neterer the temperature transient, which was severe enough to result in a Letdown isolation, was not documented because "our standards were different then". This is not true. Although it is true that "our standards were different then", it is not true that a secondary plant transient severe enough to result in a Letdown isolation did not meet "our standards". The event certainly met Duff Bottorff's standards; he documented it in CAR 200308555 38 days later after Mr. Lantz refused to. The event certainly met the CAR Screening Committee's standards; they screened it as an Adverse Condition (however, in the tradition of "Midwest Nice", they did not question why it was 38 days old and being documented by an Engineering Department trainer vice the operating crew). The truth is, this event was not documented because Dave Lantz, and possibly Dave Neterer, wanted to cover it up.

Although attempting to cover up a secondary plant transient by not documenting it in the Corrective Action Process is something an organization trusted with the operation of a nuclear power plant cannot allow of its leaders, it is not a concern which rises to the level of needing to be addressed by United States senators. However, the operating crew intentionally delaying the insertion of the Control Banks to cover up the transient, and then the organization and the Nuclear Regulatory Commission refusing to adequately address the issue once it has been uncovered, is a matter which demands the attention of our elected officials.

By 1025 on October 21, 2003 the reactor had inadvertently shutdown. The Control Banks were not inserted until 1204. In Action 5 of CAR 200702606, Dave Lantz states that he recognized the reactor shutdown shortly after it occurred. Regardless of whether or not the shutdown was immediately recognized, it was certainly recognized when the Source Range Nuclear Instruments energized at 1125 (causing a Main Control Board annunciator). In Action 5, Dave Lantz gives several reasons for the 100 minute delay in inserting the Control Banks; none of the reasons are viable. He mentions the confusion which was occurring in the Control Room due to the secondary plant transient and indication problems with one of the steam line drains handswitches; this distraction occurred prior to the 100 minute delay. He mentions responding to the loss of Letdown; Letdown was restored by 1018. He mentions performance of OTO-NN-00001 in response to a loss of NN11 which occurred earlier in the day while troubleshooting; the procedure was merely awaiting the final close out steps and there were no control room steps being performed during the time the rods were withdrawn.

None of Mr. Lantz's excuses provided in Action 5 of CAR 200702606 explain the delay in inserting the Control Banks. Mr. Lantz's crew intentionally delayed inserting the Control Banks to cover up the fact that the reactor inadvertently shutdown as a result of the plant response to the earlier secondary plant transient. The Control Banks were not inserted until 1204. This was around the time the organization expected the shutdown to occur had the attempts to repair NN11 not been successful.

Like you and I, Dave Lantz served in the nuclear navy. He was a highly trained reactor operator aboard a nuclear powered naval vessel. His exemplary knowledge of nuclear power earned him a position as a prototype instructor in the Navy's nuclear power training pipeline. He is well aware of the high standards of integrity that our nuclear navy inherited from Admiral Rickover. He understands that events are never to be covered up. He also is aware of the extreme importance Admiral Rickover placed upon conservatively controlling reactivity. He understands that the most important task for any nuclear watchstander is to ensure the reactor plant is actively controlled. On October 21, 2003 he undoubtedly recognized that his most important duty upon realizing the reactor had shut down was to ensure the reactor stayed shutdown by actively inserting negative reactivity through either insertion of the control banks or borating until adequate Shutdown Margin was calculated.

Mr. Lantz has been a Senior Reactor Operator at Callaway Plant for over a decade. He was promoted to Shift Manager relatively early due to the regard which Operations management held his performance as an Operating Supervisor. As a Shift Manager he was consistently ranked above most of his peers on his Performance Appraisals. Recently, he has been promoted to be the Superintendent of Operations Training in recognition of his abilities.

I find it hard to believe that an individual with Mr. Lantz's background and ability would not recognize the importance of promptly inserting the Control Banks to actively shutdown the reactor plant on October 21, 2003. I have had no dealings with Mr. Lantz which lead me to question his abilities; I only question his integrity.

As you can see from the email trail below, you are not the first person I have approached with this issue. Although Quality Assurance and representatives of Mr. Diya have supposedly looked into this issue, I have yet to be interviewed (other than during the statement of my initial allegations to Mr. Hollabaugh in the presence of Quality Assurance). No one investigating this matter from Callaway Plant have asked to see my evidence of why I am convinced Mr. Lantz intentionally left the Control Banks withdrawn on October 21, 2003 to cover up a plant transient.

Equally disturbing as Mr. Lantz's actions on October 21, 2003 are the actions taken by Operations in 2007 to suppress investigation of this issue. From the beginning, CAR 200701278 and CAR 200702606 have been marginalized by the Operations Department. I was placed on a Performance Improvement Plan after attempting to address the inadequate response to CAR 200701278 with Mr. Naslund earlier this year. I have had two very heated discussions with Dave Neterer regarding access to the Main Control Room key card records for October 21, 2003; the first discussion started off with him asking me "Are you trying to get me fired?" Jim Milligan deleted the actions I had drafted for CAR 200702606 (originally Action 4 but eventually sent out as Actions 5 and 6) and closed the CAR without speaking to me about it in August 2007. I was sternly counseled by Operations that I was taking a step backward on my Performance Improvement Plan when I re-opened CAR 200702606 to send my actions.

By our arbitration agreement last Friday (November 9, 2007) Ameren has fairly financially compensated me for the improper retaliation against me which occurred this summer for pursuing an answer to the events of October 21, 2003. However, Ameren has not yet adequately resolved

all the issues surrounding the event. The personnel who originally covered up the transient in 2003, and those who wish to impede its investigation still, remain in important leadership positions in the company. Regardless of the Nuclear Regulatory Commission's actions (or inaction) on this event, you and the individuals copied on this email have a duty to ensure the cover up of the October 21, 2003 inadvertent shutdown is properly investigated and resolved. Individuals willing to jeopardize the proper shutdown of the reactor plant to cover up their mistakes and individuals willing to jeopardize the careers of those who would properly investigate the issue cannot be allowed to retain leadership positions at a utility trusted with safely operating a nuclear reactor.

I am meeting with you afternoon. If necessary, I can still be available for interview after my separation from Ameren if the company ever decides to properly investigate the events of October 21, 2003 and the retaliation against me this summer. I can be reached at this email address or at (573) 230-3959.

Very respectfully,
Larry Criscione

From: Criscione, Larry S.
Sent: Thursday, November 01, 2007 2:00 AM
To: 'EMERSCHOFF@aol.com'
Cc: Franzjfjr@aol.com; Voss, Thomas R
Subject: RE: FW: CAR 200702606, CAR 200701278 and CAR 200704911

Mr. Merschoff,

Thank you for your prompt response.

I have already attempted to address this concern with my immediate supervision at Callaway (Operations management), with the Employee Concerns Program, with the Quality Assurance organization and with the Plant Manager.

I have also attempted to address this concern with Region IV of the US NRC. My original Allegation (RIV-2007-A-0028) was closed without a proper investigation. Following a letter to my US Senator (Richard Durbin, IL) the NRC has supposedly re-opened the investigation. I have not yet been interviewed by the NRC (either during the original investigation or since it has been re-opened).

I agree that you and Mr. Franz are not part of the formal process to investigate this concern. I believe it is in the best interest of the company for you, Mr. Franz and Mr. Voss to meet with me to discuss this issue, but I must concede that you are the better judge of this than I.

I appreciate your response and I thank you for your advice.

V/r,

Larry Criscione

From: EMERSCHOFF@aol.com [mailto:EMERSCHOFF@aol.com]
Sent: Tuesday, October 30, 2007 4:21 PM
To: Criscione, Larry S.
Cc: Franzjfjr@aol.com; Voss, Thomas R
Subject: Re: FW: CAR 200702606, CAR 200701278 and CAR 200704911

Mr. Criscione,

Thank you for coming forward with this issue. Your belief that a "cover-up" has occurred needs to be addressed. You have several options relative to getting your concern into a formal process for resolution. I encourage you to use any and all of them as necessary.

First, I encourage you to work with your management to assure the event is understood and appropriate action has been taken. Considering the management changes that have occurred since 2003, you have many managers in responsible positions that were not involved and can address the issue objectively.

Second, you can take the issue to the Employee Concerns Program. I understand a new Employee Concerns Coordinator is being selected. This will provide an opportunity to bring a fresh set of eyes on your concern.

Third, The NRC has the ability to look objectively at issues such as this by engineers from the Regional Office or Headquarters, and professional investigators from The NRC Office of Investigations (OI). These OI investigators are often former US Secret Service Agents or US Naval Investigative Service Agents and are very good at investigating allegations of wrongdoing.

Fourth, If you have concerns that the NRC has not taken your concerns seriously, you can contact the Office of the Inspector General. This is an organization that reports to Congress and has the responsibility of assuring that the NRC employees meet their Federal mandate of assuring public health and safety. The OIG's phone number is on the NRC Form posted in various locations in the plant, or can be obtained from the NRC's web site at www.NRC.GOV.

Finally, Mr. Franz and I are not part of the formal processes that I have described which are available for resolution of your concerns. The NRC expects the person with the concerns and the facts to come forward in order for the issue to be investigated if the problem is not being addressed by the licensee. Waiting for the next NSRB meeting to discuss this issue with Mr. Franz and me is not in the best interest of you or the plant.

Regards,

Ellis W. Merschoff, PE
President, CGE, LLC

From: Criscione, Larry S.
Sent: Tuesday, October 30, 2007 2:14 PM
To: 'emerschoff@aol.com'
Cc: 'franzjfjr@aol.com'; Voss, Thomas R
Subject: FW: CAR 200702606, CAR 200701278 and CAR 200704911

Mr. Merschoff,

At 0100 on October 21, 2003 Callaway Plant commenced a down power from 100% power due to the failure of inverter NN11. The plant was 17 hours and 39 minutes into the 24 hour LCO for T/S 3.8.7.A.

At 0721 the 6 hour shut down Limiting Condition for Operation of T/S 3.8.7.B was entered. The plant was at 38% power and the LCO required either NN11 to be restored or the plant to be shutdown to MODE 3 by 1321. The LCO also required the plant to be cooled down to MODE 5 in 36 hours if NN11 was not restored.

At 0938 with the plant around 8% power a temperature transient occurred due to the opening of the Main Turbine and MSR drains per an inappropriate procedure step. It is my opinion this transient was caused by a procedure error and not a procedure use error on the part of the Operating crew.

Over the next 25 minutes, temperature fell nearly 10°F resulting in a Letdown Isolation on low Pressurizer Level and operation of the reactor below the Minimum Temperature for Criticality.

The Letdown Isolation occurred at around 1000 and restoration commenced around 1010. Letdown flow was completely restored by 1015.

At 1013 the crew declared MODE 2 and the main turbine was tripped.

Upon tripping the main turbine, a 7°F temperature rise occurred as steam pressure built up to the Steam Pressure setpoint of the condenser steam dumps. The negative reactivity inserted by this temperature rise immediately resulted in a negative startup rate (approximately -1/6 dpm). By 1023 reactor power was past the Point of Adding Heat and startup rate was approximately -1/3 dpm.

The Shift Manager has stated in Action 5 to CAR 200702606 that he recognized the reactor shutdown shortly after tripping the turbine.

Around 1204 the crew began inserting the control banks. Between the time of the inadvertent shutdown and the initiation of control rod insertion 100 minutes later, no boration or any other deliberate insertion of negative reactivity occurred.

At 1255 the Shutdown Margin calculation was completed and MODE 3 was declared.

The operating crew never documented the RCS temperature transient or the inadvertent shutdown in the Corrective Action Process. A Callaway Action Request was written 38 days after the event by an Engineering Department trainer to document the temperature transient (CAR 200308555).

I came across the inadvertent shutdown and apparent cover up while analyzing data for CAR 200701278 in February 2007. As you can see from the email trail below, I have unsuccessfully attempted to address this issue via several avenues.

I brought this issue to the attention of Mr. Franz via email two weeks ago and have not received a response.

If possible, I would like to discuss the October 21, 2003 transient and apparent cover up with you and Mr. Franz. As you can see from the email trail below, I am not bringing this issue to you as my first choice; you and Mr. Franz are my last resort internal to the company.

You may contact me at work regarding this issue via this email address or at (573) 676-6113.

I would appreciate a response as to whether or not you intend to look into this matter.

Thank you,
Lawrence S. Criscione, PE

From: Criscione, Larry S.
Sent: Friday, October 19, 2007 8:47 AM
To: 'franzjfjr@aol.com'
Subject: CAR 200702606, CAR 200701278 and CAR 200704911

Mr. Franz,

I am sorry I was unable to meet with you yesterday; I was out sick.

I appreciate the advice you gave me on this issue. Be assured, I am not bringing this issue to you as my first course of action.

The October 1, 2007 email to Fadi Diya below essentially explains the issue.

I first came across it in mid-February 2007. During the remainder of February, I attempted to get Operations to pay attention to it. Co-incidentally in late February the company tried to force me to work unpaid overtime. Part of the discussions revolving around the unpaid overtime issue pertained to the amount of unauthorized (by my supervisor) time I had spent researching and writing CAR 200701278. At this point, I took the issue I had uncovered while researching CAR 200701278 to the NRC as Allegation RIV-2007-A-0028.

I am a Professional Engineer and as such I have an obligation to my employer to first address issues internally. I attempted to do this in February 2007 and have continued to do so. In May 2007 I met with Dave Hollabaugh on this issue. I have also met with Dr. Hughes, Les Kanuckel and Fadi Diya as well as multiple meetings with Operations.

I have been disappointed with the Nuclear Regulatory Commissions' handling of this issue and addressed it in a letter to Senator Richard Durbin (I am an Illinois resident) on August 16, 2007. I am meeting with Senator Durbin's office on October 26, 2007.

Like me, you draw a paycheck from Ameren. Although certain employees at Ameren wish to cover up this problem, it is in the interest of the share holders that it be addressed. You are my last hope internal to the company. I do not know how much help Senator Durbin's staff will be.

As a professional engineer I have an obligation to the public. People in responsible positions at a commercial nuclear plant intentionally delaying the insertion of the control banks to cover up a transient is serious business; refusing to investigate the matter is equally serious. After you and Senator Durbin, my remaining re-course is public action groups and the press. I prefer to avoid that route if possible.

I have additional data I can send you on this matter (e.g. correspondence with the NRC and Senator Durbin).

Very respectfully,
Larry Criscione

From: Criscione, Larry S.
Sent: Wednesday, October 17, 2007 12:27 PM
To: Belsky, Luanna M.
Subject: FW: CAR 200704911

Luanna,

If possible, could you please schedule a time for me to meet with Mr. Franz. I am the Shift Engineer today and can be reached at 68459 (this is not the same number as in Outlook).

Thank you,
Larry Criscione

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-----Original Message-----
From: Hollabaugh, David S.
Sent: Wednesday, October 17, 2007 12:14 PM
To: Criscione, Larry S.; Mclaughlin, Sharon S.
Subject: Re: CAR 200704911

Larry - I am offsite on business until Friday, when NSRB will be gone, so I
can't really help you.  You might check with Sharon.  Dave
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From: Hughes, Gary A.
Sent: Wednesday, October 17, 2007 11:41 AM
To: Criscione, Larry S.
Subject: RE: CAR 200704911

Talk to L Belsky. She is the keeper of the schedule for Mr Frantz.

From: Criscione, Larry S.
Sent: Wednesday, October 17, 2007 10:59 AM
To: Hollabaugh, David S.
Cc: Mclaughlin, Sharon S.; Kanuckel, Leslie H.; Hughes, Gary A.
Subject: CAR 200704911

Mr. Hollabaugh,

I was hoping to speak with Mr. Franz regarding the October 21, 2003 incident of leaving the control banks withdrawn for 100 minutes following an unplanned shutdown.

I am unable to find his contact information in Outlook (or that of any of the NSRB members). I would appreciate any assistance you might provide me in obtaining a meeting with Mr. Franz or Mr. Merschoff.

Thank you,
Larry Criscione

From: Criscione, Larry S.
Sent: Monday, October 01, 2007 9:21 AM
To: Diya, Fadi M.
Cc: Olmstead, Gary W.; Kanuckel, Leslie H.; Mclaughlin, Sharon S.; Hollabaugh, David S.; Hughes, Gary A.; Cunningham, James L.
Subject: CAR 200702606

Fadi,

CAR 200702606 has been closed. I would like to meet with you at your convenience to discuss this CAR. It was written by Gary Olmstead in March.

I would have liked to seen the Corrective Action Program handle this CAR differently, but quite frankly I believe the real issue is beyond the Corrective Action Process. For this reason, I can accept the closure of CAR 200702606 (CAR 200704911 has been more appropriately assigned, is still InProcess and addresses some of the same issues). This is an issue I would like to personally discuss with you, however. I have discussed CAR 200702606 several times with my supervisors in Operations since March.

On May 14, 2007 I met in Dave Hollabaugh's office with Dave, Sharon McLaughlin and Quality Assurance. I believe Jim Cunningham, Dr. Hughes and Les Kanuckel were all present but I am not certain. Sharon McLaughlin took notes and should be able to tell you who was present. Regardless of their presence at the meeting, I have discussed this issue separately at some point with Jim, Gary and Les.

The May 14, 2007 meeting concerned CAR 200704911 and a QA Audit which was in progress on Operations. At the meeting I expressed my concern that on October 21, 2003 the Operating Crew intentionally left the control banks withdrawn to cover up the fact that the reactor inadvertently shutdown on them shortly after tripping the turbine.

In their responses to Actions 5 & 6 of CAR 200702606, the Shift Manager and Control Room Supervisor both claim the following:

1. They were aware the reactor would go subcritical when the turbine was tripped.
2. The shutdown was not inadvertent and there was no intention to maintain MODE 2.

3. The Control Banks were not immediately inserted due to higher priority activities.

Regarding item 1: Although I am not convinced the control room staff recognized that the reactor would go subcritical upon tripping the turbine, I have no means to refute the claim that they did recognize it and will have to accept them at their word.

Regarding item 2: It has been my experience at Callaway Plant that if there is any hope that Tech Spec required equipment might be restored prior to the expiration of the Completion Time for the Limiting Condition for Operation, then the plant will remain in the LCO until just prior to the expiration of the Completion Time. Based on this experience, I believe that Plant Management expected the reactor to remain critical until the time limit for LCO 3.8.7.B was within an hour of expiring (around noon). Shutting down the reactor was the right course of action given the circumstances (the 10°F temperature excursion which brought the reactor below the Minimum Temperature for Criticality). Although the control room staff did not attempt to maintain the reactor critical after the temperature transient (a correct response to the plant conditions), they did not actively shutdown the reactor (continuation of the correct response). They allowed the reactor to passively shutdown on temperature and Xenon but took no active action (increasing boron concentration or inserting rods) for 100 minutes. As a result of their inaction, they inserted the control banks at about the time Plant Management was expecting them to. I believe this was not a co-incidence. I believe insertion of the Control Banks was intentionally delayed to avoid having to explain to Plant Management why the reactor was not maintained critical while repairs to inverter NN11 were still in progress.

Regarding item 3: I have talked to several Senior Reactor Operators and Reactor Operators regarding this event. None of them (other than the two involved) would have allowed anything to delay them in inserting the Control Banks. The “higher priority activities” which prevented the crew from promptly inserting control banks on October 21, 2003 were: the final steps of OTO-NN-00001 (page 5 of OTO-NN-00001, Rev. 006), the final step of OTO-BG-00001 (VERIFY pressurizer level being maintained at program level in automatic) and the four I&C surveillance on the Power Range Nuclear Instruments (the last of which was performed while inserting the control banks which begs the question why these surveillances delayed the insertion of the control banks).

I did not take notes at the May 14 meeting and have copied Dave, Sharon, Jim, Gary and Les to ensure I have not misstated any facts concerning this meeting. I copied Gary Olmstead because he is the Originator of CAR 200702606. Although Gary has accepted the closure of CAR 200702606, it is my understanding he does not believe this issue has, as yet, been satisfactorily resolved.

V/r,
Larry Criscione

From: Criscione, Larry S.
Sent: Monday, May 14, 2007 5:39 AM
To: Hollabaugh, David S.; Cunningham, James L.
Subject: RE: QA Audit and CARS 200704911

Dave and Jim,

Please let me know when you have time to meet today.

I have some concerns with CARS 200704911 which I intend to address with the NRC on Friday. Although the company has been made aware of all the issues in CARS 200704911 on several occasions, I want to ensure the company understands the importance of these issue before I meet with the regulators.

Thanks,
Larry Criscione

From: Kanuckel, Leslie H.
Sent: Friday, May 11, 2007 11:11 AM
To: Criscione, Larry S.
Cc: Cunningham, James L.; Hollabaugh, David S.
Subject: RE: QA Audit and CARS 200704911

I'll let you, Jim, and Dave work out a time. Les

From: Criscione, Larry S.
Sent: Friday, May 11, 2007 11:04 AM
To: Kanuckel, Leslie H.
Cc: Cunningham, James L.; Hollabaugh, David S.
Subject: RE: QA Audit and CARS 200704911

I'll take whatever you can give me on Monday.

From: Kanuckel, Leslie H.
Sent: Friday, May 11, 2007 11:00 AM
To: Criscione, Larry S.
Cc: Cunningham, James L.; Hollabaugh, David S.
Subject: RE: QA Audit and CARS 200704911

Larry, I am willing to meet with you but I can't support a 3 hour meeting. If you want to meet at 0900-1000 or 1000-1100 on Monday, I can support that. If this meeting would be to pass on info that you have put together as part of your audit preparations and that you still want factored into the audit, that is Jim Cunningham's job as an Audit Team Leader. I have full confidence that Jim would consider this info objectively and I wouldn't need to be involved in the specifics at this point. Let me know what you want to do. Les

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From: Criscione, Larry S.
Sent: Friday, May 11, 2007 9:46 AM
To: Kanuckel, Leslie H.
Cc: Cunningham, James L.; Hollabaugh, David S.
Subject: QA Audit and CARS 200704911

Les,

I was informed by Jim Milligan today that I am no longer available to assist Jim Cunningham with the QA Audit on Operations. The reason given was that I am needed to assist in working down the Operations Corrective Action backlog.

I believe the real reason is related to our discussion last week concerning CARS 200704911 – that Operations is not really interested in identifying adverse trends.

I have two CARS which I was planning to discuss with Jim Cunningham during the audit next week. I would like to set up a time on Monday when I can meet with you, Jim Cunningham and Dave Hollabaugh. I will need approximately three hours. This is a separate from topic from the one Dave Hollabaugh and I have already made plans to meet about on Monday.

Thank you,
Larry Criscione

From: Cunningham, James L.
Sent: Sunday, May 06, 2007 6:26 AM
To: Criscione, Larry S.
Subject: RE: CARS 200703391

Larry, attached is the verification plan that I want you to use to guide reviews. See you May 14-16.
Thanks,
Jim Cunningham

From: Criscione, Larry S.
Sent: Sunday, May 06, 2007 6:21 AM
To: Cunningham, James L.
Cc: Milligan, James W.
Subject: RE: CARS 200703391

Jim,

Thanks for the review. The Late Entries were added by Keith Duncan and I did verify they were present.

Several weeks ago I was told you needed me to participate during the week of May 14. As far as I know, I am working for you on May 14, 15 and 16. Jim Milligan agreed to this prior to the outage and has not told me anything to the contrary since that time.

I am attending LOCT with Steve Kochert's crew on May 10, 11 and 12 in order to be free to support the QA audit during the following week. I am working nights through May 9 so I am unavailable prior to May 14.

Somewhere in my inbox I have a schedule for the audit which you sent me. If you could forward me the latest schedule for the week of May 14 I would appreciate it.

Thanks,
Larry

From: Cunningham, James L.
Sent: Saturday, May 05, 2007 6:11 AM
To: Criscione, Larry S.
Subject: RE: CARS 200703391

Larry, did we actually make the changes that you reference in the CAR response? If so, great job and I concur with your response. Changing the subject, are you still going to be able to participate in the Ops Audit for a couple of days between May 7-18?

Corrective Actions:

The following have ammended (←misspelled) the logs:

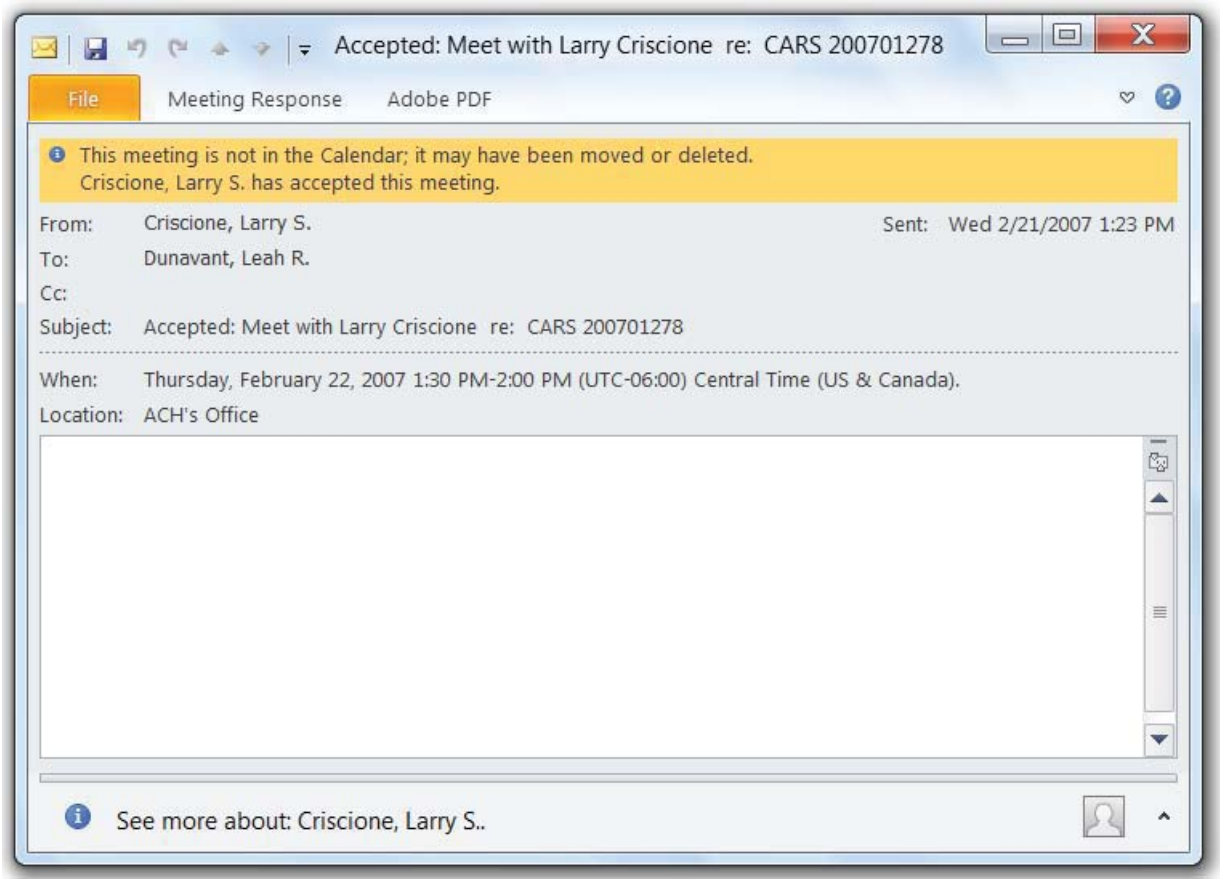
- CAR 200703391 resolution to be more specific for Log entries; PEM01A, SI PMP A stopped due to no indicated discharge pressure. Job 05515515.485 in progress.
- CAR 200703391 resolution to be more specific for Log entries; It was determined that the MCB discharge pressure indication was isolated due to manual isolation closed to support COMS and ESFAS testing. PEM01A, SI PMP A started to support Job 05515515.485 .
- CAR 200703391 resolution to be more specific for Log entries; PEM01A, SI PMP A stopped no leak-by observed, Job 05515515.485 complete SAT.

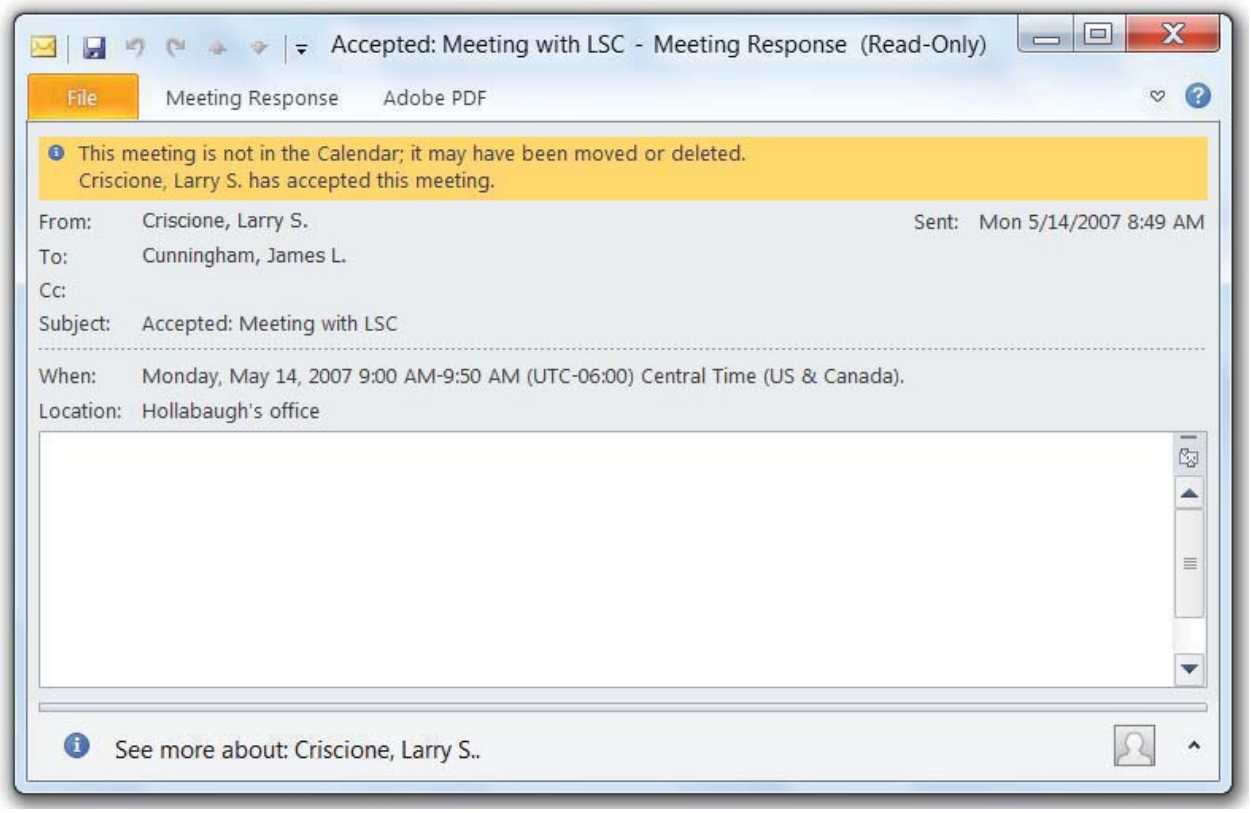
From: Criscione, Larry S.
Sent: Saturday, May 05, 2007 1:21 AM
To: Cunningham, James L.
Subject: CARS 200703391

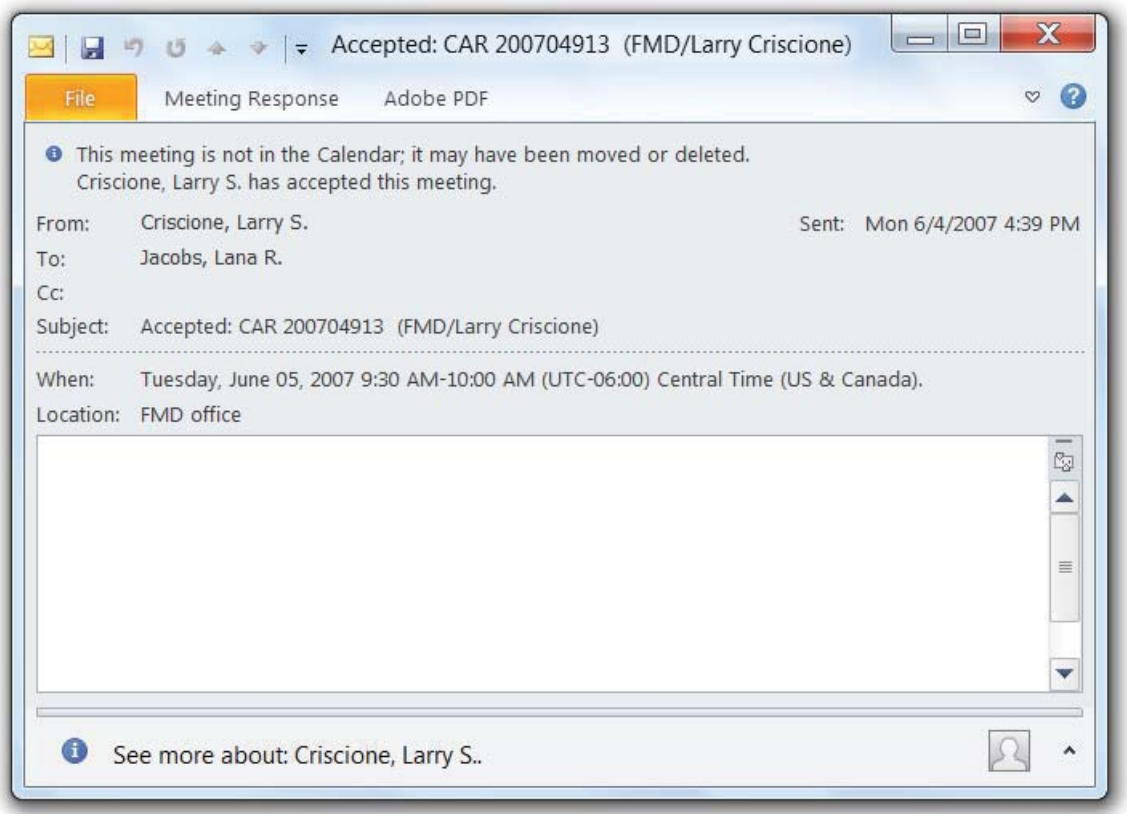
Jim,

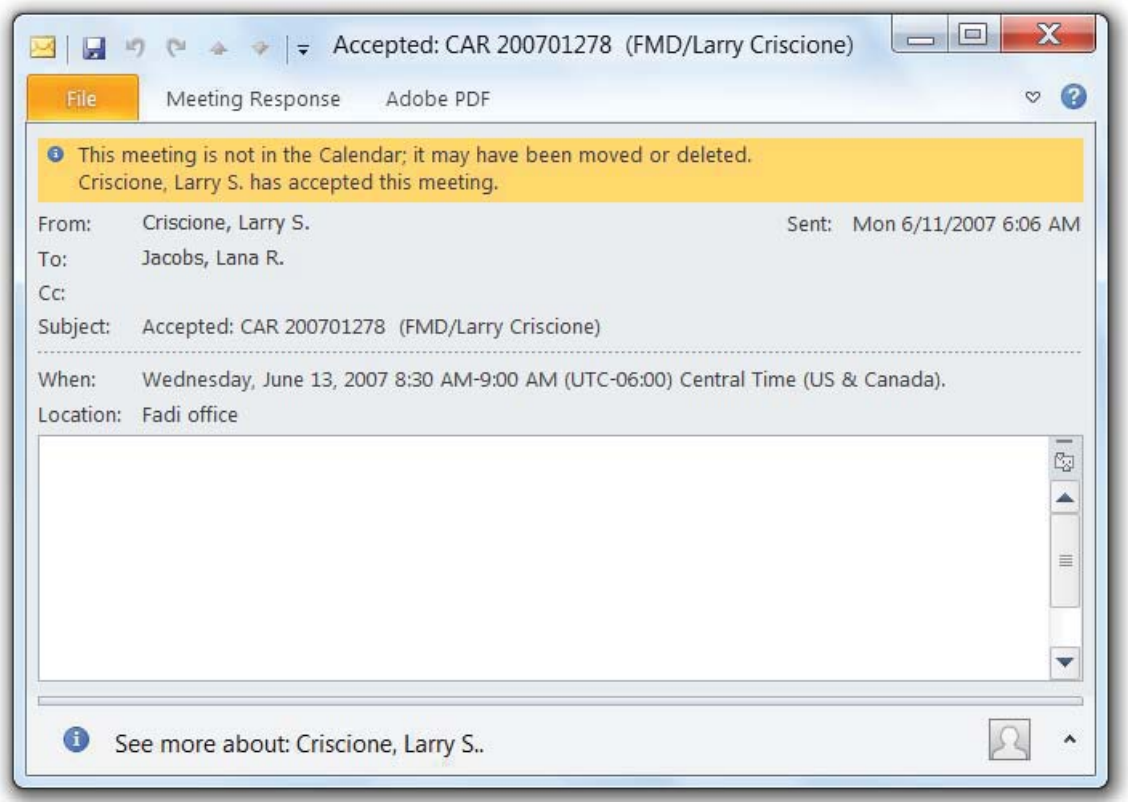
Please review the response for CARS 200703391 and let me know of any comments.

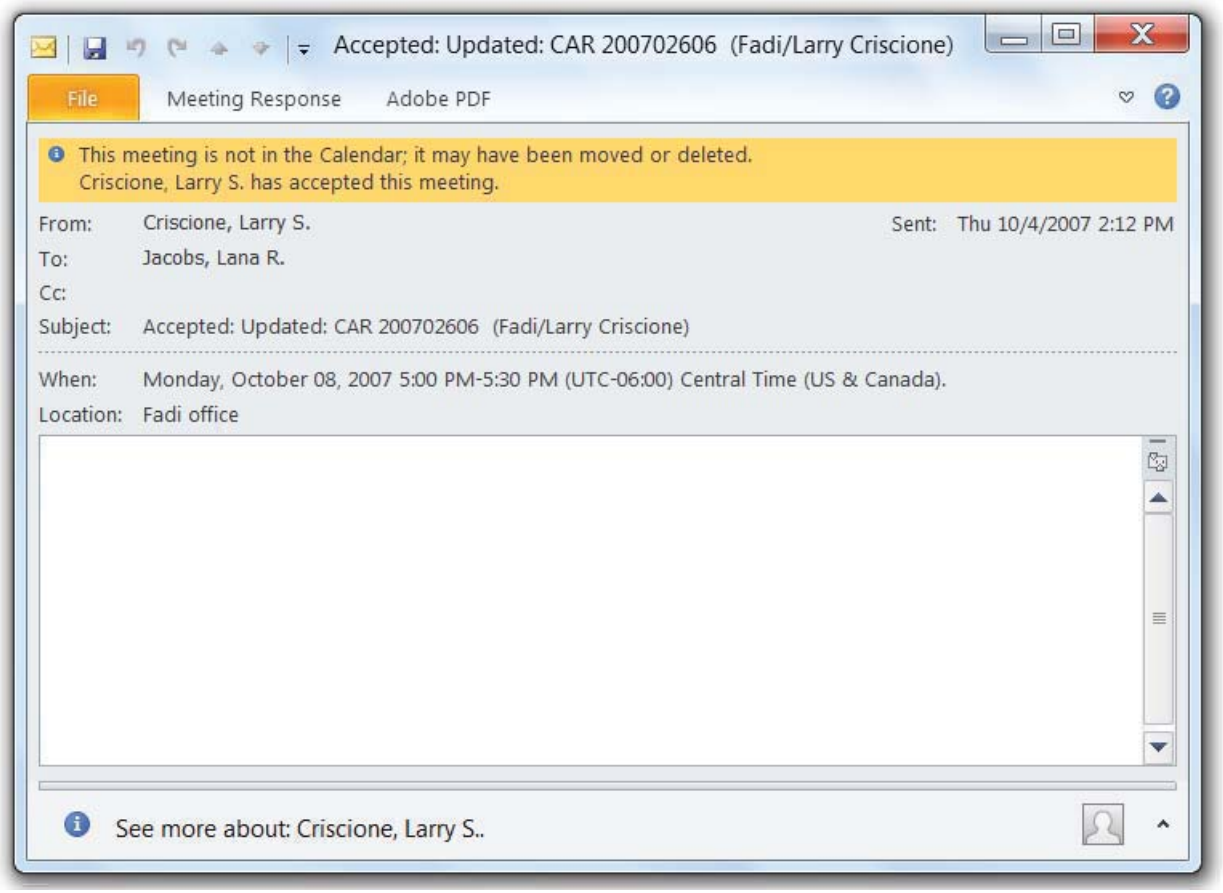
Thank you,
Larry Criscione


Accepted: Meet with Larry Criscione re: CARS 200701278
File
Meeting Response
Adobe PDF
This meeting is not in the Calendar; it may have been moved or deleted.
Criscione, Larry S. has accepted this meeting.
From: Criscione, Larry S.
Sent: Wed 2/21/2007 1:23 PM
To: Dunavant, Leah R.
Cc:
Subject: Accepted: Meet with Larry Criscione re: CARS 200701278
When: Thursday, February 22, 2007 1:30 PM-2:00 PM (UTC-06:00) Central Time (US & Canada).
Location: ACH's Office
See more about: Criscione, Larry S..


Accepted: Meeting with LSC - Meeting Response (Read-Only)
File
Meeting Response
Adobe PDF
This meeting is not in the Calendar; it may have been moved or deleted.
Criscione, Larry S. has accepted this meeting.
From: Criscione, Larry S.
Sent: Mon 5/14/2007 8:49 AM
To: Cunningham, James L.
Cc:
Subject: Accepted: Meeting with LSC
When: Monday, May 14, 2007 9:00 AM-9:50 AM (UTC-06:00) Central Time (US & Canada).
Location: Hollabaugh's office
See more about: Criscione, Larry S..


Accepted: CAR 200704913 (FMD/Larry Criscione)
File
Meeting Response
Adobe PDF
This meeting is not in the Calendar; it may have been moved or deleted.
Criscione, Larry S. has accepted this meeting.
From: Criscione, Larry S.
Sent: Mon 6/4/2007 4:39 PM
To: Jacobs, Lana R.
Cc:
Subject: Accepted: CAR 200704913 (FMD/Larry Criscione)
When: Tuesday, June 05, 2007 9:30 AM-10:00 AM (UTC-06:00) Central Time (US & Canada).
Location: FMD office
See more about: Criscione, Larry S..


Accepted: CAR 200701278 (FMD/Larry Criscione)
File
Meeting Response
Adobe PDF
This meeting is not in the Calendar; it may have been moved or deleted.
Criscione, Larry S. has accepted this meeting.
From: Criscione, Larry S.
Sent: Mon 6/11/2007 6:06 AM
To: Jacobs, Lana R.
Cc:
Subject: Accepted: CAR 200701278 (FMD/Larry Criscione)
When: Wednesday, June 13, 2007 8:30 AM-9:00 AM (UTC-06:00) Central Time (US & Canada).
Location: Fadi office
See more about: Criscione, Larry S..


Accepted: Updated: CAR 200702606 (Fadi/Larry Criscione)
File
Meeting Response
Adobe PDF
This meeting is not in the Calendar; it may have been moved or deleted.
Criscione, Larry S. has accepted this meeting.
From: Criscione, Larry S.
Sent: Thu 10/4/2007 2:12 PM
To: Jacobs, Lana R.
Cc:
Subject: Accepted: Updated: CAR 200702606 (Fadi/Larry Criscione)
When: Monday, October 08, 2007 5:00 PM-5:30 PM (UTC-06:00) Central Time (US & Canada).
Location: Fadi office
See more about: Criscione, Larry S..

From: Criscione, Larry S.
To: Diya, Fadi M.
Subject: Feedback on CAR 200701278
Date: Thursday, August 30, 2007 2:39:49 PM

Fadi,

I wrote CAR 200701278 on February 10, 2007 and sent it to Screening on February 12, 2007 after giving the Reactor Operator group two days to review it and provide me feedback.

On February 13, I attended the CARS Screening Committee meeting as an "observer" and argued CAR 200701278 should be screened as with a Sig 1, 2 or 3 (based on the fact that two of the incidents which went unanalyzed at the time should have been investigated as Sig 1 CARs). I recognized a Significance level of 1 was unlikely to be provided and told the meeting I would settle for a Sig 3 if there was a commitment by Operations to form a "Root Cause" style team to evaluate how we perform low power operations. Based on input from the Operations representative, it was screened as a Sig 4.

CAR 200701278 was reviewed by the Reactivity Management Review Committee on March 20 and upgraded to a Sig 3 on March 21.

On March 28, 2007 a team was formed and met for one hour to decide a course of action and time table. I was neither invited to the meeting nor even informed of the team's existence. As the originator of CAR 200701278 I would have at least expected the team would solicit my input.

In May I discussed the need to move forward on providing procedural guidance for low power operations with Dave Neterer, JR Weekley and Jim Milligan. On May 30 I sent an email to Chuck Naslund stressing the need to provide procedural guidance for low power operations. On June 1 I sent an email to you in which I requested a meeting to address the issue.

We met on June 5 and June 13. In the June 1 email I specifically requested that you take the lead of CAR 200701278. You informed me in one of our meetings that you were confident Operations would satisfactorily address the issue and would instead ensure the issue was addressed by assigning an action for CAR 200701278 to be brought to the Corrective Action Review Board when ready for closure.

Following our meetings Operations initially took prompt action to address CAR 200701278. A team met on June 19, 20 and 21 to evaluate CAR 200701278 and determine necessary additions to OTG-ZZ-00005. I was invited to participate in the meetings. Although the meetings were timely and productive, there was no follow through. I was never directed to incorporate guidance into OTG-ZZ-00005 and was told by Jim Milligan some one else would be handling it.

With no outside oversight to drive them, it appears Operations made no effort to incorporate the team's decisions into OTG-ZZ-00005 from June 21 to August 15. CAR 200701278 was extended for a third time (since being upgraded to a Sig 3) on July 25, 2007.

On August 15, 2007 Jim Milligan directed me to revise OTG-ZZ-00004 and OTG-ZZ-00005 such that the operators would not be permitted to attempt low power operations without the turbine unless the following conditions were met:

- Reactor Engineering had developed a Reactivity Management Plan
- The Reactivity Management Plan had been practiced in the simulator by the crew during Pre-Evolution Practice
- A dedicated RO or SRO is assigned to monitor reactivity

I pushed back by informing Jim the new requirements would prevent the plant from being able to

respond to emergent problems involving the turbine controls (such as the EHC leak experienced in May) or turbine auxiliaries. I was directed to make the necessary revisions by the end of the day and have the procedures issued prior to CAR 200701278 going to CARB on August 16.

When I questioned the urgency of the revision (there was no resources dedicated to this all summer) I was informed that CAR 200701278 was due on August 16 and a further extension would require permission from the Site Vice President. I informed Operations that because of the history of CAR 200701278 (it changed leads several times prior to RF15 and was re-screened at least once) they should ensure the due date counter was accurate prior to troubling the Vice President.

I completed the necessary procedure changes on August 15. Due to illness I was not at work on August 16. The counter was adjusted back to 2 on August 16 and CAR 200701278 was extended a fourth time (though the counter now only indicates three). The due date was changed to October 17. The reason for moving the counter from 3 to 2 is documented in the Screening Comments of CAR 200701278. The reason makes no sense to me, but it's your prerogative as to whether you wish to challenge it.

On August 20, I was directed to get OTG-ZZ-00005 issued by Tuesday (August 21). I insisted that Rick Denny review the procedure. Rick was insistent (rightfully) that the procedure be validated in the simulator prior to issue.

On the morning of August 22 when I requested Jim McInvale provide a Reactivity Management Plan for our simulator validation (which was then only three hours away) and a Reactor Engineer to support the validation I received push back (rightfully) that we should not be doing business this way. Jim's belief was that Operations should develop the procedure guidance. Reactor Engineering would be available for questions and support during the development process and would provide a Cross Discipline Review. The writing, review and validation should all occur in sequence and under a reasonable time frame. Rushing these steps in parallel solely to avoid extending a CAR due date is not acceptable. (I agree whole heartedly with Jim's position and would add that the procedure should have been reviewed by the Reactivity Management Committee prior to issuing). At the direction of Steve Reed, Jim supported the validation efforts. Jim stated he would write a CAR documenting the issue.

On August 22, OTG-ZZ-00005 was validated in the simulator. This was a last minute effort which cycled the training center and Reactor Engineering as well as the Operations day staff and shift personnel. Please note that my concern is not that OTG-ZZ-00005 should not have required validation; my concern is that the validation had to be unnecessarily rushed due to poor planning and procrastination during the summer months.

On August 23, I had a discussion with Rick Denny. He was reviewing the new addendum for the first time and had not been consulted in June (or later) when the team decided on the "pre-requisites" for low power operations (he was not available to attend the simulator validation the day earlier due to pre-planned maintenance he was assigned to coordinate). He agreed with me that the new restrictions could unnecessarily prevent the operators from being allowed to maintain MODE 1 with the turbine tripped. We discussed this concern with Jim Milligan.

In response to this concern, further revisions were incorporated into OTG-ZZ-00005. I worked 6.5 hours of unpaid overtime to incorporate these comments. Although I believe salaried personnel should be expected to put in extra time to respond to emergent developments, this was not an emergent development:

- The urgency was being driven solely to meet a due date which had no significance other than it was committed to by Operations (there was no evolution relying on it)
- The urgency was caused in large part due to procrastination – no resources were committed to revising the procedures until the due date was two days away
- The urgency was caused in part by poor leadership – the team addressing CAR 200701278 did

not involve Rick Denny or Hope Bradley early in the process even though the procedures which needed to be changed could affect outage scheduling (Rick Denny) and operation of the plant (Hope Bradley)

- The urgency was caused in part by poor decision making – the "commercial" concerns of unnecessarily restricting operations was not recognized as important by my supervisors when I was originally directed to revise OTG-ZZ-00005

The bulleted items above pertain to more than just "Respect" for the time of salaried persons; they pertain to nuclear safety. Having to rush through a procedure revision is not the way a nuclear plant should do business. "Time pressure" is noted throughout the industry as a contributor to human performance errors.

OTG-ZZ-00005 was issued after the end of normal working hours on August 24 due to further delays experienced on that day: Hope Bradley had to have her comments incorporated at the last minute because her input was not solicited earlier in the process.

CAR 200707757 was written to ensure comments which could not be addressed during the review and validation process were incorporated in future revisions. Although the items in CAR 200707757 can reasonably be considered "Enhancements", they are important and could have easily been incorporated had a reasonable time frame for writing, reviewing and validating the procedure been allotted.

I typically copy the involved individuals on emails such as this for two reasons:

1. As a courtesy for them to know what feedback I am providing to you.
2. To allow them to correct any misstatements or misunderstandings I might have.

Because of the blunt nature of this email, I have decided to send it to only you. As a professional, I am sure you will reserve judgment on any individual's actions until you have heard their side of the story.

I am taking a risk at providing you this feedback. I am providing you this feedback because it is information I believe you need to have. It is an example of how our process is not functioning smoothly even though our Performance Indicators might indicate it is. I never saw the CAR which Jim McInvale stated he would write on August 22 and would not blame him for not writing it. Providing a dissenting voice at Callaway Plant is rewarded with words only but is often punished with actions.

I have a Performance Improvement Plan which directs me to "Keep department leadership informed of issues." Please recognize it is impossible for me to take this through my chain of command and still provide you an accurate accounting in the end of the way I perceive events to have occurred. By directly providing you this feedback I am opening myself up to Performance Appraisal comments regarding going around my chain of command. However, my chain of command has been informed of these issues many times and has failed to address them.

Many of the events presented above are undocumented because they occurred as conversations. I have been provided a Performance Improvement Plan which directs me to "Utilize accurate verbal and written communications." By providing you this feedback, I am opening myself up to Performance Appraisal comments regarding inaccuracies – both from inaccurate statements I may have made because I do not have all the information available and from false claims of others denying my version of events.

I have stated my view of events bluntly. I have been provided a Performance Improvement Plan which directs I "Do not degrade peers verbally or in written communications" and "Utilize non-confrontational terminology in verbal and written communications." In the past Operations has viewed a blunt accounting of errors as both "confrontational" and "degrading". By providing you this feedback, I am opening myself up to Performance Appraisal comments regarding both "degrading" and "confrontational" comments.

I have an obligation to my employer (the share holders of Ameren) to not ignore this issue (inadequate organizational response to CAR 200701278). In spite of this obligation, I would not be providing you feedback if I believed you did not desire it. If I believed Mr. Heflin, Mr. Naslund or Mr. Voss was interested in this feedback I would provide it to them. If you do not desire I directly provide you feedback, please let me know so I will not waste your and my time in the future.

As the owner of the Corrective Action Process, I am informing you that you have disappointed me. The solution to CAR 200701278 involved more than just meeting artificial due dates and placing the right words in the Lead Response. It should have involved laying out a plan, setting milestones, meeting commitments and reviewing the final product. I would suggest that in June you should have required a time table from Operations for developing and implementing a solution to CAR 200701278. A short review of where we were at on the time table should have occurred at every CARB meeting; if progress was unacceptable a break out meeting in your office at a future time should have been arranged for the CAR Lead to explain why the plan could not be implemented and what was necessary for recovery.

Finally, you can never go wrong by inviting the Originator to CARB. [I was not invited to CARB as the Originator; however, I must confess that I was invited to the August 16 CARB to represent Operations because of other commitments which Jim Milligan, JR Weekley and Dave Neterer had on that date. I did look forward to attending CARB, but was unable to come to work on August 16 due to illness.]

Very respectfully,
Lawrence Criscione

From: Mcinvale, James B.
Sent: Friday, August 24, 2007 8:11 AM
To: Criscione, Larry S.
Cc: Denny, Rick J.; Hopkins, David L.; Milligan, James W.; Weekley, John R.
Subject: RE: OTG-ZZ-00005 Revision for CAR 200701278

It's an Ops call.

If it were me, I'd weigh the risk of cluttering up the procedure with a lot of contingencies and decision and keep it simple - either have a tested plan and stick to it, or go to Mode 3. It's not like we will often have a need to go to low power without enough time to get a plan together. Worst case, you have to do a Reactor Start-up and lose a little time/generation.

Again, just my opinion – it's an Ops call.
Jim

From: Criscione, Larry S.
Sent: Thursday, August 23, 2007 10:11 PM
To: Mcinvale, James B.
Cc: Weekley, John R.; Bradley, Evelyn H.; Milligan, James W.; Denny, Rick J.; Bradley, Gregory L.
Subject: OTG-ZZ-00005 Revision for CAR 200701278

Jim,

OTG-ZZ-00005 and its addendum are still being revised.

The emails below contain some of the history on this.

When I took the procedures to Rick Denny for review today, he felt (and I agreed) that we were being overly restrictive by:

1. Not allowing the crews to trip the turbine and maintain MODE 1 without PrEP training. This requirement essentially prevents an emergent rapid downpower to MODE 1 under any and all circumstances.
2. Not allowing the plant the option to conduct MODE 2 operations under any circumstances.

Our solution to #1 is to remove the PrEP and IPTE requirements from the version of Addendum 03 which you agreed to this afternoon.

Our solution to #2 is to issue a second addendum (Addendum 04) which is similar to what we have been attempting to issue for the last week.

JR Weekley, Hope Bradley, Jim Milligan, Rick Denny and Greg Bradley are all "on board" with the latest plan. I would like to meet with you as early as possible on Friday to ensure we can issue the procedures.

I am sorry this effort has been so disorganized over the last week. I have been trying to get this issue resolved since February but was not allotted time to work on it until last Wednesday (August 15). The final product is essentially what me and Rick agreed to in late February but due to his other commitments I was unable to get Rick to put his weight behind this until today.

Please page me when you arrive at work Friday morning and let me know when you are available to meet.

Thank you,
Larry Criscione

From: Criscione, Larry S.
Sent: Thursday, August 23, 2007 1:29 PM
To: Denny, Rick J.
Cc: Milligan, James W.
Subject: RE: OTG-ZZ-00005, Addendum 03 Validation Results

I believe we should have a procedure to take the plant to MODE 2 and hold power. Such a procedure would need to require an IPTE brief, Pre-Evolution Practice and a Reactivity Management Plan.

I am not confident that any crew on any night can successfully maintain MODE 2 descending without just-in-time preparation and a specific Reactivity Management Plan. With PrEP, an IPTE brief, Reactivity Management Plan and proper procedural guidance, I am confident all our crews can successfully maintain MODE 2.

The procedural guidance for this evolution would be very different than that provided for maintaining 7 to 14% power without the turbine. It should be a separate procedure (addendum). Mixing MODE 2 with 7 to 14% power will unnecessarily clutter the instructions for both evolutions.

After discussing the validation of Addendum 03 with Jim Milligan, he believes we should issue Addendum 03 for MODE 1 operations only to close CAR 200701278 and write a separate Addendum for MODE 2 operations (the MODE 2 addendum is not needed to close CAR 200701278). I agreed with this decision.

Where I disagreed with Jim was making the low MODE 1 addendum an IPTE procedure and requiring PrEP and a Reactivity Plan in the pre-requisites. I believe PrEP and a Reactivity Management Plan should be required by the ODP, but requiring them in the pre-requisites might unnecessarily tie our hands in the future. Since the Addendum now requires the crew to abort the evolution if MODE 2 is reached, the danger of repeat a Zion or Surry event are no longer present. The concern of repeating the Zion or Surry events was what originally drove the IPTE designation.

From: Denny, Rick J.
Sent: Thursday, August 23, 2007 12:54 PM
To: Criscione, Larry S.
Subject: RE: OTG-ZZ-00005, Addendum 03 Validation Results

Larry,
Can we take the plant to 2%, go on Aux Feed to repair a common problem with the MFPs? Or do you feel we should just go to Mode 3?
Rick

From: Criscione, Larry S.
Sent: Thursday, August 23, 2007 12:47 PM
To: Milligan, James W.; Hopkins, David L.; Weekley, John R.; Denny, Rick J.; Bradley, Evelyn H.
Cc: Bonvillian, David G.; Aldrich, Steven V.; Kimminau, Gregory T; Maxwell, Scott A; Mcinvale, James B.; Carr, Thomas D.
Subject: OTG-ZZ-00005, Addendum 03 Validation Results

Gentlemen and Hope:

Yesterday we validated OTG-ZZ-00005, Addendum 03 in the simulator. I am having difficulty incorporating the validation comments.

The validation was performed smoothly. The crew had no difficulty maintaining power and temperature in the required band. Although a "worst case" simulator IC was not available (our IC was for a 10%/hour down power from 100% to 30% power vice a 30%/hour down power so the Xenon transient was near the peak vice the point of maximum slope), the operators generally concurred a stronger Xenon transient could have been handled.

Most of the validation comments dealt with language I placed in the procedure for recovery from MODE 2.

My philosophy in writing the procedure was to have instruction for maintaining the reactor critical in low MODE 1 between 7% to 14% power. However, I did not intend to have the operators abort the effort if power lowered below 7% power and even into MODE 2 as long as the operators felt they could recover in a controlled manner. I received several comments on these steps and cautions.

I believe with a proper procedure and timely preparation (PrEP, IPTE brief, Reactivity Management Plan), we can rely on any of our crews to:

1. recognize when reactor power should not be recovered or attempts to maintain reactor power are futile
2. if recoverable, transition back to MODE 1 and restore reactor power to the band.

If we do not wish the crews to recover reactor power from MODE 2 (i.e. if in the procedure we will make 5% power a point at which the crew must transition back to OTG-ZZ-00005 to perform a reactor shutdown) then I do not believe PrEP, IPTE brief or Reactivity Management Plan are essential. That is:

- the procedure need not be IPTE
- PrEP should be required by the ODP but should not be a pre-requisite in the procedure
- A Reactivity Management Plan should be required by the ODP but should not be a pre-requisite in the procedure.

I base the above three items on the ease at which the operators maintained 7 to 14% yesterday. Well

above the POAH the reactor is stable. As long as the Xenon transient can be handled with the available rod height and dilution capability, there should be no problems safely operating the reactor within this band. Aborting the evolution if MODE 2 is reached will ensure the historic pitfalls encountered when attempting to recover the plant below the POAH (Zion and Surry events) will not occur.

Please provide me your comments on the above. I believe an addendum which aborts the evolution when power transits below 5% will meet the requirements to close CAR 200701278. An ITPE addendum which allows recovery of reactor power from short transients below 5% power is worth pursuing (and is currently written and in the review process) but is not required for closure of CAR 200701278.

Thank you,
Larry Criscione

From: Criscione, Larry S.
Sent: Friday, June 01, 2007 8:03 AM
To: Milligan, James W.; Weekley, John R.; Bradley, Evelyn H.; Neterer, David W.
Cc: Diya, Fadi M.
Subject: FW: Low Power Reactor Operation - Commercial Concern

For your information.

From: Criscione, Larry S.
Sent: Friday, June 01, 2007 12:35 AM
To: Diya, Fadi M.
Cc: Naslund, Charles D.; Heflin, Adam C.
Subject: FW: Low Power Reactor Operation - Commercial Concern

Mr. Diya,

Jim Milligan has suggested I should have addressed this through my chain of command prior to requesting intervention from a Senior Vice President. Although I have indirectly addressed this issue with you (during discussions regarding CAR 200704911) I never directly requested your intervention in addressing the need for a team to develop guidance for Low Power Reactor Operation following a rapid down power.

Since mid-February, I have been attempting to get Reactor Engineering and Operations to look at the data attached to CAR 200701278. Unfortunately, Operations does not recognize the value in analyzing our past mistakes for future improvement. The next link in the chain is you.

In the email below, I mistakenly stated a team had not yet been formed. Mr. Milligan has informed me a team consisting of himself, Dave Hopkins and Jim McInvale met prior to RF15. At that meeting they verified that all immediate concerns had been addressed by Mr. Denny and defined the remaining issues to be addressed. Meeting minutes were apparently not taken. No post RF15 meetings have occurred or as yet are scheduled to occur.

Jim Milligan, Dave Hopkins and Jim McInvale are not the individuals to address this issue. Although all three are competent men, their relatively senior positions in their departments will prevent them from meeting in a timely manner. These three men are the group which should be reviewing the proposal made by the real team. The real team should consist of Reactor Operator(s), Reactor Engineer(s), Lewis Beaty (or another engineer associated with the Plant Computer upgrade) and myself – people whom Callaway Plant can commit to a week long “Root Cause” style team.

In addition to previously holding a SRO license at Callaway, I have operations experience at Clinton Power Station and was an Engineering Officer of the Watch on both a submarine and a surface plant.

I was qualified as an Engineer Officer by Naval Reactors and hold a PE license in Nuclear Engineering. During my ship board assignment on a submarine I experienced many Xenon transients; during my prototype assignment I conducted many shutdowns and short turnaround startups. I have a good deal of experience dealing with Xenon and temperature transients at low reactor powers (and I do recognize I must defer to the experience of my Reactor Operators since there are significant differences between highly enriched naval cores and low enrichment commercial cores). I am also more familiar with the data from CAR 200701278 than anyone else on site and have a strong relationship with many of the Reactor Operators. I can only speculate why Operations does not want to utilize me to address this issue.

Please recognize this is NOT an Operations issue. The loss of 31 hours of generation is an Ameren Generation issue. For this reason and because the solution involves both Operations and Engineering, I would like you to sponsor CAR 200701278.

As a Professional Engineer, I have an obligation to my employer to ensure issues are either appropriately addressed at my level or the solutions are at least rejected by the appropriate level of authority (which for this issue is Mr. Voss). Although Mr. Milligan and Mr. Neterer are my supervisors, they are not my employer. Ameren is my employer. The reluctance of Operations to analyze and learn from its mistakes has negatively impacted Ameren in the past (i.e. June 17, 2005). I owe it to my employer to ensure this does not occur in the future.

I would like to meet with you next week to discuss CAR 200701278 and the options for seeing it properly addressed in a timely manner (i.e. before a MODE 2 or low MODE 1 forced outage). Please let me know when a good time for you to meet is and I will ensure I am available.

V/r,
Larry Criscione

From: Criscione, Larry S.
Sent: Wednesday, May 30, 2007 9:04 PM
To: Naslund, Charles D.
Cc: Voss, Thomas R; Heflin, Adam C.; Herrmann, Timothy E.; Diya, Fadi M.; Neterer, David W.; Patterson, John T. (Callaway Plant); Denny, Rick J.; Lancaster, Jeffrey D.; Weekley, John R.; Bradley, Evelyn H.; Milligan, James W.; Belchik, George N.; Bianco, Frederick J.; Harris, Shane M.; Keyes, James L.; Miner, Stephen V.; Ganz, Steven T.; Jennings, Michael D.; Shannon, Patrick C.; Dumas, James W.; Yager, Jeffrey W.; Mcinvale, James B.; Olmstead, Gary W.; Lamb, Ronald T.
Subject: Low Power Reactor Operation - Commercial Concern

Mr. Naslund,

In the past five years Callaway Plant has twice attempted to maintain Mode 2 descending and has been unsuccessful both times. The second time (June 17, 2005) cost the company 31 hours of lost generation. This could have been avoided had lessons been learned from the first event (October 21, 2003) which appears to have never been brought to the attention of upper management.

In February, CAR 200701278 documented the difficulties the plant has experienced with maintaining low reactor power. The data analysis which led to CAR 200701278 was done in support of the pre-RF15 upgrade of OTG-ZZ-00005 (Plant Shutdown 20% Power to Hot Standby). CAR 200701278 requested two items:

1. Prior to RF15, determine the required plant conditions to successfully perform OSP-AC-00005 (Turbine Actual Overspeed Trip).
2. After RF15, develop a proceduralized strategy for maintaining the reactor critical in MODE 2-descending (or in low MODE 1).

Item 1 was successfully accomplished by Rick Denny prior to RF15. CAR 200701278 was then assigned to Operations daystaff for item 2.

The team requested for item 2 has not yet been formed. The need to form this team has been stressed to Operations leadership several times during the past two weeks.

Currently, there is an EHC leak from CIV #1. It may be necessary to shutdown the turbine to fix this leak. Provided the operators have the appropriate guidance and information, at this time in core life it should be possible to maintain 10% reactor power while repairing the EHC leak – even if the down power prior to the shut down is conducted at 30%/hr due to degradation of plant conditions. The coordination of Operations, Training and Reactor Engineering will be crucial to the success of maintain the reactor critical following an emergent (30%/hr) shutdown evolution.

The current EHC leak is a prime example of why the plant should not delay in committing the necessary resources to develop the strategy requested in item 2 of CAR 200701278.

Your support of this endeavor would be appreciated by those who may be challenged with maintaining power following a rapid shutdown.

Very respectfully,
Lawrence Criscione

From: Criscione, Larry S.
To: Olmstead, Gary W.; Hopkins, David L.; Mcinvale, James B.
Subject: CAR 200702606 investigation
Date: Friday, August 24, 2007 2:18:02 PM

Gentlemen:

I was assigned the Lead for CAR 200702606 last Thursday (8/17). Jim McInvale was assigned Action 1 of CAR 200702606 on March 21 with the non-specific directive to "Evaluate acceptability of the reactivity management for this condition and expected plant response." This Action was closed on April 18. Jim basically came to the conclusion which I did in CAR 200701278: reactor safety was never in question due to the Xenon transient and there is no apparent reason for delaying 100 minutes for inserting the control rods. Like me, he could not completely assess the issue from a data and document review alone. This he noted in the Action response:

> A review of this data cannot assess the manner in which reactivity was monitored and controlled, nor does it reflect other plant conditions in process at the time.

The only way to determine whether reactivity was managed appropriately is to interview the operators. Hopefully they will remember what went on that day and will give an honest account. Below is Action 4 of CAR 200702606. I am planning on assigning it to the operators present in the control room on the day of the shutdown. Please review the action and let me know if there are any concerns or questions I should include:

> This action is being assigned to gather information for evaluating the needed corrective actions for closure of CAR 200702606.
>
> Document the following information in the Lead Response to this action:
>
> 1. Why did the Operating Crew not document the secondary plant transient which caused the letdown isolation in the Callaway Action Request System on the date it occurred or on a preceding date?
> 2. When did the control room operators recognize that the reactor was shut down?
> 3. Who on the Operating Crew recognized the reactor had shutdown?
> 4. Why was the inadvertent shutdown of the reactor not documented in the control room log?
> 5. Who in Operations upper management was informed that the reactor had shutdown?
> 6. Who in plant upper management was informed that the reactor had shutdown?
> 7. What activities were in progress which prevented insertion of the control banks for 100 minutes?
> 8. Why did the Operating Crew not document the inadvertent shutdown of the reactor in the Callaway Action Request System?

Thank you,

Larry Criscione

Callaway Action Request System

Action Request

Cars Number	Cars Type	Status	Discover Date	Due Date
200702606	Adverse Condition	InProcess	3/20/2007	10/17/2007

Originator	Department	Phone
Olmstead, Gary (6738)	O	64522

Lead	Department	Phone
Criscione, Lawrence (14827)	O	66113

SS Notified	NMR	ASME	NOW	Safeguards	Per Safety	Ec
True	False	False	False	False	False	Fa

Summary Description

Shutdown for NN11, October of 2003

Description

Condition Description (Problem Statement)

This CAR is being written after a review of the data for the NN11 forced shutdown in October of 2003. This data looks much different than any of the other shutdowns analyzed in CAR 200701278. The reactor appears to have been taken sub-critical, and entered the source range, with Control Bank D still above 100 steps. The Control Banks stayed in this withdrawn condition for almost 2 hours before they were inserted. It looks much different than any shutdowns I have been involved in, and is much different than any of the other 9 shutdowns looked at in the above mentioned CAR.

No CAR was ever written to document this unique shutdown, or at least I can't find one. This CAR may be noteworthy from a reactivity management standpoint, or it may not be, but the question has not been asked previously.

See the graphs attached to CAR 200701278. Control rods were moved at 9:45 in the morning on 10/21/03. The reactor was subcritical (-1/3 dpm) at 10:15. Source ranges were energized by around 10:35. We began inserting control rods (starting with D above 100 steps) at about 12:05. They were fully inserted at 12:15.

It has also been brought to my attention that there was an RCS temperature control issue during this shutdown. It appears that RCS temperature dropped 10 degrees, from 560 degrees to 550 degrees (which is below the minimum temperature for criticality) at about 9:59. This is documented in CAR 200308555.

What is unusual is that CAR 200308555 was written 38 days after this event, by a Technical Training Supervisor, who was not present in the Control Room that day. He had been reviewing data for some training he was going to conduct, and stumbled across it. A review of the logs does show a log entry for the loss of letdown, and for entry into the OTO, but there is no log entry for going below the miminum temperature for criticality, or for the unplanned Tech Spec entry. This log entry was required by Ops procedures.

Again, this is hindsight, and our standards have changed since October of 2003. However, even in 2003, we should have written a CAR for a plant problem that led to an RCS temperature control issue, a loss of let down, an OTO entry, and an unplanned Tech Spec entry. That seems to be a common thread for this shutdown.

Details of the condition

Described above.

Recommended Additional Actions to Resolve this Issue

Figure why this shutdown is so different than others. Determine if there are any corrective actions needed. Provide training to licensed operators if needed.

Document Immediate Actions Taken in the Immediate Actions Box below

Immediate Actions

Wrote this CAR, and requested training. This happened in 2003, so immediate action is not particulary appropriate. Training request was 200702597.

Lead Response

Problem Statement:

This CAR is being written to review the data for the NN11 forced shutdown in October of 2003. The reactor appears to have been taken sub-critical, and entered the source range, with Control Bank D still above 100 steps. The Control Banks stayed in this withdrawn condition for almost 2 hours before they were inserted.

Remedial Actions Taken:

There are no remedial actions required in response to this CAR as it documents a occurence that happened in 2003.

Extent of Condition:

This CAR will be be included in the review of reactor shutdowns identified in CAR 200701278 This will be the extent of operating events that will be reviewed under this CAR and CAR. 200701278

Results of Lower Tier Cause Evaluation (LTCE):

A team has been established to evaluate the events identifed under CAR200701278:

1. **Inadequate procedural guidance**: Procedures utilized did not contain adequate guidance for low power operations and in some instances contained requirements to level/hold power at low levels to take data while shutting down and susceptible to appreciable xenon transients.
2. **Unfamiliarity/poor preparation**: No Reactivity Management plan was utilized for low power operations. Therefore, operators who performed the evolution did not have the opportunity to practice the evolution utilizing the most effective/efficient reactivity management methods.

Corrective Actions:

The following operating thresholds have been established, if these can not be met, the unit will be placed in Mode 3.
If it is desired to hold power in mode 1 with the turbine offline, this will require a reactivity management plan, and Manager Operations approval if PrEP is not performed.
If it is desired to hold power in mode 2 with the turbine offline, this will require a reactivity management plan, an IPTE brief, and PrEP.

ODP-ZZ-00001 Add 10, Reactivity Management, and OTG-ZZ-00005, Plant Shutdown 20% Power to Hot Shutdown will be revised to incorporate the following corrective actions

CA1: Incorporate Addendum 3, Mode 1 Turbine Offline, such that if it is desired to hold power in mode 1 with the turbine offline, this will require a reactivity management plan, and Manager Operations approval if PrEP is not performed.

CA2: Incorporate Addendum 4, Mode 2 Maintaining Mode 2 Following a Downpower - IPTE, such that if it is desired to hold power in mode 2 with the turbine offline, this will require a reactivity management plan, an IPTE brief, an extra

dedicated RO to monitor Reactor power and PrEP.

Guidance will be included to direct a Reactor Shutdown if the above conditions can not be met.

Additionally, training will be provided to the operating crews covering the new procedure guidance and the reasons for it. TRRQ 200702680 and 200702597 have been generated to request training on the OE gained from low power operations.

Justification if no Corrective Action was taken

N/A

Closure Statement:

Procedure guidance identified in the above corrective actions have been issued into procedure ODP-ZZ-00001 rev. 3, and OTG-ZZ-00005 Addendum 3 Rev. 0, and Addendum 4 Rev.0.
TRRQs 200702680 and 200702597 have been generated to request training on the OE gained from low power operations, and the procedure changes developed as corrective action to this CAR.
SOER 07-01 has been reviewed, no additional actions are necessary to close this CAR, any additional actions will be addressed under CAR 200707507.

Justification for due date extension from 2007-04-20 to 2007-06-14: This CAR has been extended to allow implemetation of the defined corrective actions. These conditions deal with reactivy effects from a rapid shutdown, there are no adverse affects from extending this CAR.

Justification for due date extension from 2007-06-14 to 2007-07-26: This CAR has been extended to allow implemetation of the defined corrective actions. These conditions deal with reactivy effects from a rapid shutdown, there are no adverse affects from extending this CAR.

Justification for due date extension from 2007-07-26 to 2007-08-17: Approved by Dave Neterer / JR Weekley person working on this CAR requested extension due to health issues

Justification for due date extension from 2007-08-17 to 2007-10-17: Extended by J. Weekley due to newly issued SOER07-01 and the need to ensure our changes are in compliance withe the recomendations of the SOER issued Aug 10th 2007 and captured in CAR 200707507

Justification for due date extension from 2007-09-03 to 2007-10-17: Extended by J. Weekley due to newly issued SOER07-01 and the need to ensure our changes are in compliance withe the recomendations of the SOER issued Aug 10th 2007 and captured in CAR 200707507

Screening Worksheet

Performance Code	*Significance*	***Committee:***	*ORC*	*SAFE*	*PARC*	*CARB*	*MREP*
SI	3		False	False	False	False	False

Evaluations:	*MER*	*MCR*	*9MR*	***Closures:***	*Noted*	*Admin Close*
	True	True	False		False	False

Dispositions:	*MR*	*MSPI*	*MRA1*	*Repo*	*Trans*	*NMR*	*Oper*	*ASME*	*OOTR*	*PHPE*	*EPE*	*CCE*	*RWRK*	*PROC*
	False	False	False	False	False	False	False	False	False	False	False	False	False	False

Keywords

Keyword	*Description*
OUTAGE	OUTAGE - Outage
REACTOR	REACTOR - Reactor
RF15 RVWD	MODE RESTRAINTE REVIEWED - CAP RESTRICTED USE
RMRC	Reactivity Management Review Committee

RMRC-OE	RMRC- Operating experience disposition
ROD	ROD - Control rod related
SHUTDOWN	SHUTDOWN - Shut down of the nuclear reactor/reaction
TRAINING	TRAINING - Training
TRAINING ILT	Training Program - Initial License Training
TRAINING LOCT	Training Program - Licensed Operator Continuing Training
TRAININGOBJ 4	ACAD 02-001 Objective 4 - Continuing Training
TRAININGOBJ 4.3	ACAD 02-001 Criterion 4.3 - Continuing Training

Systems & Components

System	*Component*	*Component Description*
NN	NN11	NN11

Trend Codes

Trend Type	*Trend Code*	*Description*
Cause	PL002ENF	PERFORMANCE STANDARD NOT ENFORCED
Activity	OP001PCD	PLANT COOL DOWN (MODE 3 TO NO MODE)
Event Type	OE003FSD	FORCED SHUTDOWN/ LOAD REDUCTION

History

Type	*Description*	*User Pin*
H	Shift Manager changed from to Bianco, Frederick (502) by Olmstead, Gary (6738) on Mar 20 2007 2:59PM	6738
H	Car Status changed from Initiate to Screening by Olmstead, Gary (6738) on Mar 20 2007 2:59PM	6738
H	OPS Worksheet created by Kochert, Steven (3269) on Mar 20 2007 11:30PM	3269
H	Car Lead changed from to Milligan, James (4002) by Haintel, Teresa (9862) on Mar 21 2007 12:44PM	9862
H	Car Status changed from Screening to Evaluate by Haintel, Teresa (9862) on Mar 21 2007 12:48PM	9862
H	Initial Action Release by Haintel, Teresa (9862) on Mar 21 2007 12:48PM	9862
H	Car Due Date changed from Apr 20 2007 12:00AM to Jun 14 2007 12:00AM by Milligan, James (4002) on Apr 19 2007 5:53PM	4002
H	Car Status changed from Evaluate to InProcess by Milligan, James (4002) on Apr 30 2007 1:42PM	4002
H	Car Due Date changed from Jun 14 2007 12:00AM to Jul 26 2007 12:00AM by Milligan, James (4002) on Jun 8 2007 4:24PM	4002
H	Car Lead changed from Milligan, James (4002) to Hopkins, David (2785) by Milligan, James (4002) on Jul 16 2007 2:20PM	4002
H	Car Lead changed from Hopkins, David (2785) to Milligan, James (4002) by Hopkins, David (2785) on Jul 23 2007 8:39AM	2785
H	Car Due Date changed from Jul 26 2007 12:00AM to Aug 17 2007 12:00AM by Weekley, John (6186) on Jul 25 2007 4:39PM	6186
H	Car Lead changed from Milligan, James (4002) to Criscione, Lawrence (14827) by Milligan, James (4002) on Aug 15 2007 6:03PM	4002
H	Car Due Date changed from Aug 17 2007 12:00AM to Oct 17 2007 12:00AM by Weekley, John (6186) on Aug 16 2007 3:22PM	6186

H	Car Lead changed from Criscione, Lawrence (14827) to Milligan, James (4002) by Milligan, James (4002) on Aug 27 2007 6:59AM	4002
H	Car Status changed from InProcess to PendingClose by Milligan, James (4002) on Aug 27 2007 10:24AM	4002
H	Car Due Date changed from Oct 17 2007 12:00AM to Sep 3 2007 12:00AM by Milligan, James (4002) on Aug 27 2007 10:24AM	4002
H	Car Status changed from PendingClose to Closed by Milligan, James (4002) on Aug 27 2007 11:41AM	4002
H	Car Status changed from Closed to InProcess by Criscione, Lawrence (14827) on Aug 27 2007 12:58PM	14827
H	Car Lead changed from Milligan, James (4002) to Criscione, Lawrence (14827) by Criscione, Lawrence (14827) on Aug 27 2007 12:59PM	14827
H	Car Due Date changed from Sep 3 2007 12:00AM to Oct 17 2007 12:00AM by Criscione, Lawrence (14827) on Aug 27 2007 1:00PM	14827

Actions

1 - Mcinvale, James (9245) - NESR - 90 - - 4/20/2007 - Eval acceptability of the reactivity management for this condition

2 - Weekley, John (6186) - O - 90 - MER - 4/26/2007 - Management Evaluation Review

3 - Milligan, James (4002) - O - 99 - MER - 5/7/2007 - Management Evaluation Review

4 - Weekley, John (6186) - O - 90 - MCR - 9/3/2007 - Management Close Review

5 - Lantz, David (7414) - TL - 50 - - 10/17/2007 - Document Events During October 21, 2003 shutdown

6 - Rauch, Gerald (8371) - TL1 - 50 - - 10/17/2007 - Document Events During October 21, 2003 shutdown

Callaway Action Request System

Action Detail

Cars Number	Action Type	Action Number	Status	Due Date
200702606		1	Closed	4/20/2007

Assigner	Department	Phone
Milligan, James (4002)	O	68720

Assignee	Department	Phone
Mcinvale, James (9245)	NESR	68247

Summary Description

Eval acceptability of the reactivity management for this condition

Description

Evaluate acceptability of the reactivity management for this condition and expected plant response.

Action Response

Data trends for this shutdown were obtained from eDNA and provided to the CARs lead responder. It appears that reactor power was lowered from 100% RTP to approximately 8% (by delta T indication) at a rate of approximately 10% /hr. At this point, the power reduction was halted. RCs temperature decreased from 559 degrees F to 549 degrees F over a 25 minute span, likely due to transient Xenon from the shutdown. Several RCS dilutions were initiated during the cooldown, totaling approximately 350 to 400 gallons (about a 5 ppm dilution worth approx 45 pcm), but control rods remained at D bank at 100 steps. Xenon reactivity added during the cooldown was approximately -120 pcm. RCS T-avg was below the minimum temperature for criticality (551 degrees) for approximately 13-14 minutes, before it was restored, apparently by a temperature increase following tripping the turbine (approx 10:13).
At this point, it appears that the temperture defect from the heat-up, assisted by the Xenon peaking, took the reactor into mode 2 and then subcritical and below the POAH (as indicated by trends of Intermediate Range currents) at approximately 10:20. Source range detectors automatically re-energized at approximately 11:25. Control rods were inserted at approximately 12:05, at which time Mode 3 was entered and declared. 400 to 450 pcm negative reactivity was added by Xenon from the time of the turbine trip until control rods were inserted.
Reviewed Reactivity Control, Power Distribution, and RCS Tech Specs and FSAR chapter 16 requirements applicable to Modes 1, 2 and 3. The only identified challenge was to minimum temperature for criticality, and this was restored within the allowed time. Note that SDM requirements were not challenged during the event in Mode 3, and RILs not challenged in Modes 1 and 2.
A review of this data cannot cannot assess the manner in which reactivity was monitored and controlled, nor does it reflect other plant conditions in process at the time. No reactivity control/indication system problems (rod control, DRPI, bank demand position, make-up control system, excore nuclear instrumentation) were found.
Added on May 21, 2007 by Lawrence Criscione:
The temperature transient mentioned in the first paragraph above was caused by a secondary plant transient as documented in CARS 200308555. OTN-AC-00001 had inadequate guidance for operating the MSR drains. The guidance was revised per an action of CARS 200308555. Criscione 5/21/2007

History

Type	*Description*	*User Pin*
H	Action created by Haintel, Teresa (9862) on Mar 21 2007 12:47PM	9862
H	Action Status changed from Initiate to Evaluate by Haintel, Teresa (9862) on Mar 21 2007 12:48PM	9862
H	Action Status changed from Evaluate to InProcess by Mcinvale, James (9245) on Apr 16 2007 12:41PM	9245
H	Action Status changed from InProcess to Closed by Mcinvale, James (9245) on Apr 18 2007 2:14PM	9245
H	Action Status changed from Closed to InProcess by Criscione, Lawrence (14827) on May 21 2007 6:17AM	14827
H	Action Status changed from InProcess to Closed by Criscione, Lawrence (14827) on May 21 2007 6:24AM	14827

Callaway Action Request System

Action Detail

Cars Number	Action Type	Action Number	Status	Due Date
200702606		5	Closed	9/14/2007

Assigner	Department	Phone
Criscione, Lawrence (14827)	O	66113

Assignee	Department	Phone
Lantz, David (7414)	TL	68512

Summary Description

Document Events During October 21, 2003 shutdown

Description

This action is being assigned to gather information for evaluating the needed corrective actions for closure of CAR 200702606.

Document the following information in the Lead Response to this action:

1. Why did the Operating Crew not document the secondary plant transient which caused the letdown isolation in the Callaway Action Request System on the date it occurred or on a preceding date?
2. When did the control room operators recognize that the reactor was shut down?
3. Who on the Operating Crew recognized the reactor had shutdown?
4. Why was the inadvertent shutdown of the reactor not documented in the control room log?
5. Who in Operations upper management was informed that the reactor had shutdown?
6. Who in plant upper management was informed that the reactor had shutdown?
7. What activities were in progress which prevented insertion of the control banks for 100 minutes?
8. Why did the Operating Crew not document the inadvertent shutdown of the reactor in the Callaway Action Request System?

Action Response

As this event occurred nearly 4 years ago, my responses below are based upon a review on plant data, control room log entries, plant procedures in effect at the time of the event, and my own personal recollections. Why did the Operating Crew not document the secondary plant transient which caused the letdown isolation in the Callaway Action Request System on the date it occurred or on a preceding date? Obviously in hindsight, this issue should have been documented in the CARS application. Apparently our threshold was not where it should have been nearly 4 years ago. It was subsequently documented in CAR 200308555 on 11/28/03. When did the control room operators recognize that the reactor was shut down? Mode 2 was declared at 10:13 a.m., one minute after tripping the main turbine. Mode 3 was declared at 12:55 a.m. after all Control Banks were fully inserted and a Shutdown Margin calculation had been completed. Due to the RCS temperature rise from the manual turbine trip and the negative reactivity being inserted from the buildup of Xenon, the reactor was most probably subcritical approximately 10 minutes after the turbine was tripped. Who on the Operating Crew recognized the reactor had shutdown? I can not speak for the entire Operating Crew, but I believe the Control Room staff was aware that with the turbine off-line and the continual buildup of Xenon, the reactor would subseqently become subcritical. Mode 3 is not proceduraly declared until all Control Banks are fully inserted and and a Shutdown Margin calculation has been completed. I realized the reactor would go subcritical prior to directing the manual turbine trip. I felt this was a conservative action since RCS temperature had dropped below the minimum temperature for critcality. Since we had no intention of maintaining the reactor critical, I believed the conservative action was to trip the turbine, stabilize RCS temperature, and continue with the response to the off-normal procedures (we were still in OTO-BG-00001 and OTO-NN-00001 at this time). Why was the inadvertent shutdown of the reactor not documented in the control room log? I take exception with the use of term "inadvertent shutdown of the reactor". This was an unplanned plant shutdown due to being in a 6 hour action to be in Mode 3 due to a failure of NN11 inverter. The reactor was not inadvertently shutdown. The plant was being shutdown at 10% per hour. While attempting to stabilize power low in Mode 1, a temperature transient occurred due to some problems with the Group B Turbine/MSR drains. Since there was no itent to stay in Mode 1 or Mode 2 (still in a 6 hour action statement to Mode 3) a manual turbine trip was directed to stabilize RCS temperature and continue with the

plant shutdown. The manual turbine trip was logged at 10:12 a.m. and Mode 2 was logged at 10:13 a.m. There was no log entry made for the exact time that the reactor went subcritical. Logging the time that the reactor goes subcritical was not a procedure requirement nor an expectation. Who in Operations upper management was informed that the reactor had shutdown? As this event occurred nearly 4 years ago, I can not recall the exact communications that were made. The site was staffed up to support the Forced Outage. I believe that plant announcements were made for entering Mode 2 and Mode 3. Most likely the Operations Coordinator and Outage Manager were also informed of the Mode 2 and Mode 3 entries. Who in plant upper management was informed that the reactor had shutdown? As this event occurred nearly 4 years ago, I can not recall the exact communications that were made. The site was staffed up to support the Forced Outage. I believe that plant announcements were made for entering Mode 2 and Mode 3. Most likely the Operations Coordinator and Outage Manager were also informed of the Mode 2 and Mode 3 entries. What activities were in progress which prevented insertion of the control banks for 100 minutes? The on-shift crew was responding to an RCS temperature transient due to a problem with the Group B Turbine/MSR drains. This was compounded by an indication problem with ACHIS0131 which required local observations of the 13 drain valves which are operated by this switch. In addition, the staff was responding to a loss of letdown per OTO-BG-00001 and a loss of NN01 per OTO-NN-00001. The loss of NN01 was a second loss of NN01 which occurred during the troubleshooting and repair attempts for NN11. The second loss of NN01 was not completely exited until 11:37 a.m. To the best of my recollection, once the final OTO was exited at 11:37 a.m., we had a Control Room brief to update the staff on all of the actions taken for the Loss of Letdown and the Loss of NN01. We then discussed the remaining actions necessary to complete in OTG-ZZ-00005 for the plant shutdown and reactor shutdown. After the brief was completed, we continued with the insertion of Control Banks. Control Banks were inserted from CB 'D' at 100 steps at 12:05 a.m. to all Control Banks fully inserted at about 12:15 a.m. Subsequent to fully inserting all Control Banks, a Shutdown Margin calculation was performed. This was completed at 12:55 a.m. and a log entry was made for entry into Mode 3. Why did the Operating Crew not document the inadvertent shutdown of the reactor in the Callaway Action Request System? Obviously in hindsight, this entire event should have been documented in the CARS application. Our threshold for documentation was not where it should have been 4 years ago. Again I would state the the reactor was NOT inadvertently shutdown. The plant was in a 6 hour action to be in Mode 3 due to a failure of NN11 inverter. When I directed a manual turbine trip low in Mode 1 in response to an RCS temperature transient, I was aware that the loss of turbine load, subsequent RCS heatup, and the continual buildup of Xenon from the down power would result in the reactor going subcritical. My intent was to continue with the plant shutdown and reactor shutdown. There was never any intent to stay in Mode 1 or Mode 2.

History

Type	*Description*	*User Pin*
H	Action created by Criscione, Lawrence (14827) on Aug 27 2007 1:03PM	14827
H	Action Status changed from Initiate to Evaluate by Criscione, Lawrence (14827) on Aug 27 2007 1:04PM	14827
H	Action Due Date changed from Oct 17 2007 12:00AM to Oct 16 2007 12:00AM by Criscione, Lawrence (14827) on Aug 28 2007 7:00AM	14827
H	Action Due Date changed from Oct 16 2007 12:00AM to Aug 30 2007 12:00AM by Criscione, Lawrence (14827) on Aug 28 2007 5:51PM	14827
H	Action Due Date changed from Aug 30 2007 12:00AM to Sep 14 2007 12:00AM by Lantz, David (7414) on Aug 29 2007 5:42PM	7414
H	Action Status changed from Evaluate to InProcess by Lantz, David (7414) on Sep 4 2007 9:22AM	7414
H	Action Status changed from InProcess to Closed by Lantz, David (7414) on Sep 5 2007 10:28AM	7414

Callaway Action Request System

Action Detail

Cars Number	Action Type	Action Number	Status	Due Date
200702606		6	Closed	9/14/2007

Assigner	Department	Phone
Criscione, Lawrence (14827)	O	66113

Assignee	Department	Phone
Rauch, Gerald (8371)	TL1	68510

Summary Description

Document Events During October 21, 2003 shutdown

Description

This action is being assigned to gather information for evaluating the needed corrective actions for closure of CAR 200702606.

Document the following information in the Lead Response to this action:

1. Why did the Operating Crew not document the secondary plant transient which caused the letdown isolation in the Callaway Action Request System on the date it occurred or on a preceding date?
2. When did the control room operators recognize that the reactor was shut down?
3. Who on the Operating Crew recognized the reactor had shutdown?
4. Why was the inadvertent shutdown of the reactor not documented in the control room log?
5. Who in Operations upper management was informed that the reactor had shutdown?
6. Who in plant upper management was informed that the reactor had shutdown?
7. What activities were in progress which prevented insertion of the control banks for 100 minutes?
8. Why did the Operating Crew not document the inadvertent shutdown of the reactor in the Callaway Action Request System?

Action Response

1. Why did the Operating Crew not document the secondary plant transient which caused the letdown isolation in the Callaway Action Request System on the date it occurred or on a preceding date?
The cooldown was documented in CAR 20030855. The only reason that I believe that it was not done at that time was due the work load. As shown in the logs there were a lot of required surveillances going on that shift and the work load was very high in the Control Room. At this time no Work Control Center existed. A review of the Shift Manning sheets, indicate that the STA was only in the Control Room for the AM shift.

2. When did the control room operators recognize that the reactor was shut down?
Mode 2 was declared one minute after tripping the turbine. I considered the reactor shutdown shortly after the Mode 2 entry. Per the Note prior to Step 5.2.7 of OTG-ZZ-00005 Rev. 18, Mode 3 could not be officially declared until all Control Banks are on the bottom and shutdown margin was calculated. That is why the Mode 3 log entry was not until 12:55.

3. Who on the Operating Crew recognized the reactor had shutdown?
I believe the entire Control Room crew knew the reactor was shutdown shortly after the Mode 2 entry. It had been discussed that Mode 3 could not be administratively declared until all Control Banks had been inserted and a shutdown margin calculated. There was no requirement in the OTG to log the reactor shutdown.

4. Why was the inadvertent shutdown of the reactor not documented in the control room log?
This was not an 'inadvertant shutdown'. The plant was in the six hour shutdown statement of Tech Spec 3.8.7.B. The plant had entered 3.8.7.A (a 24 hour action statement) at 07:21 on 10/20/03. An attempt was made to see if the inverter was repaired at 08:21 on 10/21/03. When it failed again, the Control Room proceeded with 3.8.7.B which requires Mode 3

within 6 hours AND Mode 5 within 36 hours. There was no attempt to stay in low Mode 1 or even Mode 2. As required by Tech Specs the plant had to be in Mode 3 by 13:21 on 10/21/03. As previously stated, Mode 3 could not be administratively declared until all the Control Banks were inserted and a shutdown margin calculated.

5. Who in Operations upper management was informed that the reactor had shutdown?
Since this was a forced outage, I believe all necessary notifications were made for the required Mode 3 entry, especially since it was a required Tech Spec Action.

6. Who in plant upper management was informed that the reactor had shutdown?
Since this was a forced outage, I believe all necessary notifications were made for the required Mode 3 entry, especially since it was a required Tech Spec Action.

7. What activities were in progress which prevented insertion of the control banks for 100 minutes?
The crew was trying to restore RCS temperature, letdown, pressurizer level, and deal with numerous other items. I&C was doing required surveillances on SENI42, 43, and 44 at the time. A Shutdown Margin had to be calculated. Considering the work load and briefs, 100 minutes does not seem unreasonable. The reactor was already shutdown.

8. Why did the Operating Crew not document the inadvertent shutdown of the reactor in the Callaway Action Request System?
There was no 'inadvertant shutdown' of the reactor. The decision had been made after the NN01 failure at 08:21 to go to Mode 3 as required by Tech Specs. As previously stated, the plant had to be in Mode 3 by 13:21 on 10/21/03. The plant was shutdown per OTG-ZZ-00005 Rev. 18. Obviously the standard has been raised on Control Room Log entries and more should have been made. Also a CAR critiquing the shutdown should have been written, but there was no inadvertant shutdown of the reactor.

History

Type	*Description*	*User Pin*
H	Action created by Criscione, Lawrence (14827) on Aug 27 2007 1:04PM	14827
H	Action Status changed from Initiate to Evaluate by Criscione, Lawrence (14827) on Aug 27 2007 1:04PM	14827
H	Action Due Date changed from Oct 17 2007 12:00AM to Oct 16 2007 12:00AM by Criscione, Lawrence (14827) on Aug 28 2007 7:00AM	14827
H	Action Due Date changed from Oct 16 2007 12:00AM to Aug 30 2007 12:00AM by Criscione, Lawrence (14827) on Aug 28 2007 5:51PM	14827
H	Action Due Date changed from Aug 30 2007 12:00AM to Sep 7 2007 12:00AM by Rauch, Gerald (8371) on Aug 30 2007 6:02AM	8371
H	Action Due Date changed from Sep 7 2007 12:00AM to Sep 14 2007 12:00AM by Rauch, Gerald (8371) on Sep 5 2007 5:13PM	8371
H	Action Status changed from Evaluate to InProcess by Rauch, Gerald (8371) on Sep 12 2007 11:51AM	8371
H	Action Status changed from InProcess to Closed by Rauch, Gerald (8371) on Sep 12 2007 11:51AM	8371

Callaway Action Request System

Action Detail

Cars Number	Action Type	Action Number	Status	Due Date
200702606		7	Closed	8/30/2007

Assigner	Department	Phone
Criscione, Lawrence (14827)	O	66113

Assignee	Department	Phone
Patterson, John (4430)	OU	68318

Summary Description

Document Events During October 21, 2003 shutdown

Description

This action is being assigned to gather information for evaluating the needed corrective actions for closure of CAR 200702606.

Document the following information in the Lead Response to this action:

1. Did the Operating Crew inform the Emergency Duty Officer about the secondary plant transient which caused the letdown isolation and entry into OTO-BG-00001?
2. Did the Operating Crew inform the Emergency Duty Officer that the reactor inadvertently shut down shortly after tripping the turbine?
3. Was the Emergency Duty Officer involved in the decision to leave rods withdrawn following the inadvertent shutdown?
4. What activities were in progress which prevented insertion of the control banks for 100 minutes?
5. Why did the Operating Crew not document the inadvertent shutdown of the reactor in the Callaway Action Request System?

Action Response

This event happen almost 4 years ago. I have reviewed auto log and to the best of my recollection I do not recall discussing what caused the letdown isolation. Reviewing the plots of the cooldown it appears we did not isolate the steam system and we cooled down to the point we lowered pressurizer level to the letdown isolation setpoint. There was no discussion about going below the point of adding heat or the reactor going sub-critical as I remember the situation. I did not have any discussion about leaving rods out with the reactor sub-critical with the Shift Manager. I can not answer Question 4&5 as I do not believe I was in the Control Room during this time period.
JTP

History

Type	*Description*	*User Pin*
H	Action created by Criscione, Lawrence (14827) on Aug 28 2007 9:34AM	14827
H	Action Status changed from Initiate to Evaluate by Criscione, Lawrence (14827) on Aug 28 2007 10:00AM	14827
H	Action Due Date changed from Sep 19 2007 12:00AM to Aug 30 2007 12:00AM by Criscione, Lawrence (14827) on Aug 28 2007 5:50PM	14827
H	Action Status changed from Evaluate to InProcess by Patterson, John (4430) on Aug 30 2007 1:45PM	4430
H	Action Status changed from InProcess to Closed by Patterson, John (4430) on Aug 30 2007 1:45PM	4430

Larry Criscione

From: Criscione, Larry S.
Sent: Monday, August 27, 2007 4:16 PM
To: Olmstead, Gary W.
Cc: Hopkins, David L.
Subject: RE: CAR 200702606 investigation

Gary,

At 0659 this morning, Jim Milligan changed the Lead on CAR 200702606 from me to himself. At 1024 he changed the due date to Sept. 3 and at 1141 he closed the Callaway Action Request.

At some time before 1021, he deleted my Action 4 and replaced it with a Management Close Review action. While I was writing Action 4, I had it assigned to me. Since it was still in Initiate, all record of it disappeared when Jim deleted it.

Jim gave no explanation in his response to CAR 200702606 for the suspicious time delay for inserting the control rods. Because of this, I re-opened CAR 200702606, restored the Lead to myself, restored the due date to October 17, restored Action 4 as Actions 5 & 6 and sent Actions 5 & 6 to Dave Lantz and Gerry Rauch respectively.

Because of my Control Room coverage today, I have been unable to discuss with Jim why he closed CAR 200702606 and deleted my action.

In a May 14, 2007 meeting with Dave Hollabaugh and Quality Assurance, I discussed the incidents described in CAR 200702606. I do not know the status of Mr. Hollabaugh's investigation, and I do not believe Mr. Hollabaugh intends to discuss his investigation (if there is any) with me upon its completion. I also discussed the issue with Mr. Peck and Mr. Dumbacher on June 6. Jim Milligan, JR Weekley and Fadi Diya were informed of my conversation with the residents. If the Employee Concerns Program, the Quality Assurance Department, the United States Nuclear Regulatory Commission resident inspectors and the Plant Manager are unconcerned with this issue, I do not suspect I will be successful addressing it through the Callaway Action Request System.

I discussed my email below with Dave Hopkins. His opinion is:

- Because the event occurred more than three years ago, we will likely never know the reason for the delay
- Although the current closure of CAR 200702606 leaves some questions unanswered, these questions no longer need to be answered for the safe operation of the plant
- The improvements to OTG-ZZ-00005 which resulted from CAR 200701278 are adequate resolution to all the operational issues associated with CAR 200702606.

I agree with all of the above. If Actions 5 & 6 do not provide adequate answers, I will have to consider this issue closed as far as the Corrective Action Process is concerned. Any further investigation of this issue would (and should) be conducted outside of the Corrective Action Process.

Larry Criscione

From: Olmstead, Gary W.
Sent: Monday, August 27, 2007 11:57 AM
To: Criscione, Larry S.
Subject: RE: CAR 200702606 investigation

Larry
Those seem to be the relevant questions. I can't think of any others.

Thanks
Gary

From: Criscione, Larry S.
Sent: Friday, August 24, 2007 2:18 PM
To: Olmstead, Gary W.; Hopkins, David L.; Mcinvale, James B.
Subject: CAR 200702606 investigation

Gentlemen:

I was assigned the Lead for CAR 200702606 last Thursday (8/17). Jim McInvale was assigned Action 1 of CAR 200702606 on March 21 with the non-specific directive to "Evaluate acceptability of the reactivity management for this condition and expected plant response." This Action was closed on April 18. Jim basically came to the conclusion which I did in CAR 200701278: reactor safety was never in question due to the Xenon transient and there is no apparent reason for delaying 100 minutes for inserting the control rods. Like me, he could not completely assess the issue from a data and document review alone. This he noted in the Action response:

> A review of this data cannot assess the manner in which reactivity was monitored and controlled, nor does it reflect other plant conditions in process at the time.

The only way to determine whether reactivity was managed appropriately is to interview the operators. Hopefully they will remember what went on that day and will give an honest account. Below is Action 4 of CAR 200702606. I am planning on assigning it to the operators present in the control room on the day of the shutdown. Please review the action and let me know if there are any concerns or questions I should include:

> This action is being assigned to gather information for evaluating the needed corrective actions for closure of CAR 200702606.
>
> Document the following information in the Lead Response to this action:
>
> 1. Why did the Operating Crew not document the secondary plant transient which caused the letdown isolation in the Callaway Action Request System on the date it occurred or on a preceding date?
> 2. When did the control room operators recognize that the reactor was shut down?
> 3. Who on the Operating Crew recognized the reactor had shutdown?
> 4. Why was the inadvertent shutdown of the reactor not documented in the control room log?
> 5. Who in Operations upper management was informed that the reactor had shutdown?
> 6. Who in plant upper management was informed that the reactor had shutdown?
> 7. What activities were in progress which prevented insertion of the control banks for 100 minutes?
> 8. Why did the Operating Crew not document the inadvertent shutdown of the reactor in the Callaway Action Request System?

Thank you,

Larry Criscione

From: Criscione, Larry S.
Sent: Tuesday, October 16, 2007 11:50 AM
To: Neterer, David W.; Milligan, James W.; Weekley, John R.
Cc: Belchik, George N.; Barton, Robert G.
Subject: Meeting Notes for Re-Opening CAR 200702606
Attachments: Company's Summary from 8-28-2007 with Criscione's comments.pdf

Gentlemen,

On the morning of October 16, 2007 I found, in my company office mail slot, a summary of the meeting notes from the August 28, 2007 meeting I had with JR Weekley and Jim Milligan concerning the Re-opening of CAR 200702606.

I have reviewed the meeting notes as best I could. I would like to note that the meeting occurred 49 days ago. I consider taking seven weeks to provide the summary as excessive; this limits my ability to review these notes for accuracy.

Although there are gaps in the summary provided to me, I view it as an acceptably accurate version of the meeting. In the first email of the trail below (dated August 28, 2007) I provided my comments of the meeting. I have received no feedback on these comments and assume Jim Milligan and JR Weekley agree with these comments.

On the Attachment to this (today's) email I have attached my comments to the company's summary which I received today. If the company disputes my comments, I would appreciate they provide me their feedback.

I am still awaiting the company's summary from the October 10, 2007 meeting between me and Jim Milligan at which Rich Eickelman took notes. I would appreciate it if this summary be provided more promptly (I believe 7 days vice 7 weeks to be more appropriate) than the summary for the August 28 meeting. At this meeting, I requested to be removed from my Performance Improvement Plan and the onerous burden of providing weekly updates. Jim informed me my performance was still in need of improvement. I would like the company to provide me, in writing, examples of where I have failed to meet the expectations of the company with regard to satisfactory performance. Preferably these examples will be during the past four months (time period of the PIP), but any and all examples are appreciated.

Yesterday (October 15, 2007), just prior to 1530 Jim Milligan requested that I meet with him to discuss some emails from last week. I informed Jim I was on my way out the door, but could stick around until 1615. A little after 1545, I was invited into JR Weekley's office for a meeting with Jim at which George Belchik was the witness. George was not taking notes at the meeting. Mid-way through the meeting, I began taking notes. At the end of the meeting, I reviewed my notes with Jim and George and made changes which Jim requested. Prior to departing, Jim asked for my notes. He stated he wanted the notes so that the company can summarize them. I provided them to him with the expectation (not verbalized) that this summary will also be provided to me and will be provided in a reasonable amount of time.

The subject matter of the meeting from yesterday was an email I had sent to Jim Milligan at 0745 on October 11, 2007 regarding my handling of EFFR 200406454. At the meeting, Jim quibbled over wording in the second sentence of the email and in the final sentence of the item 2. Jim informed me the email appeared I was not displaying leadership on this issue. I view this meeting as a pointless waste of my time. Although I do appreciate feedback from the company, a "one-way" conversation whose primary purpose is to document perceived deficiencies in my performance is not useful feedback.

I have displayed "leadership" on this issue going back to 2005. My first attempt to address EFFR 200406454 resulted in CAR 200502887. This was a well researched CAR documenting problems in our Corrective Action Process. At the end of CAR 200502887 in the fifth (final) bullet I recommended that Operations incorporate Immediate Boration standards into LOCT scenarios. I discussed this suggestion in detail with Bob Barton in 2005

I have further displayed "leadership" on this issue in my email from 1055 on October 11. Although Jim had access to this email as well, he refused to discuss it at the meeting.

Until this point, I have given the company the benefit of the doubt that the scheduling of performance review meetings beyond my normal working hours have been due to unintentional personnel mismanagement and not intentionally undertaken to create a hostile working environment for me. Please note that I understand there will be times when I must

remain late to meet with my supervisors. To some point I can accept this inconvenience; provided the meeting is more than just an attempt by the company to misrepresent my performance in order to justify their continued discrimination.

Very respectfully,
Larry Criscione

From: Criscione, Larry S.
Sent: Thursday, September 13, 2007 1:44 PM
To: Milligan, James W.
Subject: RE: Meeting Notes

I am working on it now.

From: Milligan, James W.
Sent: Thursday, September 13, 2007 1:44 PM
To: Criscione, Larry S.
Subject: RE: Meeting Notes

Larry,
Do you have your PIP summary for this week?

From: Criscione, Larry S.
Sent: Thursday, September 13, 2007 11:00 AM
To: Neterer, David W.
Cc: Milligan, James W.; Eickelman, Richard E.; Weekley, John R.
Subject: RE: Meeting Notes

Dave,

I received via office mail a copy of Rich Eickelman's notes from the September 11, 2007 meeting I had with Jim Milligan to discuss my 2nd Quarter Performance Appraisal.

I have reviewed Rich's notes and have no comments on the notes. I would like to comment that there was no discussion in the meeting concerning my performance during the second quarter of 2007. The only "performance" issue discussed was me re-opening CAR 200702606 which occurred in the third quarter.

During the second quarter (June) I had several meetings with various plant representatives (Jim Milligan, JR Weekley, Dave Neterer, Fadi Diya, Dave Hollabaugh) in which my performance was either directly or indirectly part of the meeting. If possible, I would like written feedback from the company on the adequacy of my performance during the second quarter. It would help me improve my performance if this feedback provided examples of when my performance was deficient.

I still have not received a summary of the notes from my August 28 meeting with JR Weekley and Jim Milligan concerning the re-opening of CAR 200702606.

I appreciate the opportunity afford to me by the company to review the meeting notes of the September 11, 2007 meeting.

V/r,
Larry Criscione

From: Criscione, Larry S.
Sent: Tuesday, September 11, 2007 1:32 PM
To: Neterer, David W.
Cc: Milligan, James W.; Eickelman, Richard E.; Weekley, John R.
Subject: Meeting Notes

Dave,

I left our meeting yesterday with the understanding that during future meetings between me and my supervisors the following would occur:

1. At the end of the meeting we would review our notes together.
2. In a reasonable time frame following the meeting I would be provided a summary of any notes taken by the company.

I just met with Jim Milligan for my 3rd Quarter Performance Appraisal. Jim asked Rich Eickelman to witness the meeting. Rich took notes. At the end of the meeting, I requested that we review Rich's notes. Jim stated that we would not do that. He also stated he was not aware that he needed to provide me a summary (or copy) of the notes from now on for all meetings regarding my performance.

Please let me know whether I had a miss understanding regarding our discussion yesterday or whether the misunderstanding is Jim's.

Thank you,
Larry Criscione

From: Criscione, Larry S.
Sent: Monday, September 10, 2007 6:47 AM
To: Neterer, David W.
Subject: FW: Meeting Concerning Re-opening CAR 200702606

Dave,

I am still awaiting an answer from you on items 9 & 10 below. I intend to request a meeting to discuss this issue with Mr. Diya.

V/r,
Larry

From: Criscione, Larry S.
Sent: Wednesday, August 29, 2007 6:17 AM
To: Neterer, David W.
Cc: Weekley, John R.; Milligan, James W.
Subject: FW: Meeting Concerning Re-opening CAR 200702606

Dave,

I had an error in my email below. The requests I wish to discuss with you are items **9 & 10** below (my original email had them as 7 & 8). Sorry for the confusion.

Also, at the meeting yesterday, I was told to get CAR 200702606 completed before I leave on Friday. Since Friday is my day off, this requires me to complete CAR 200702606 by the end of business tomorrow. I have changed the due dates on the actions I sent to Dave Lantz, Gerry Rauch and John Patterson. I do not understand the urgency of getting this done this week, but I will make every effort to meet that date. Meeting the date will be dependent on Dave, Gerry and John being able to complete their actions.

With regard to "extending" the due date without receiving permission: Jim Milligan changed the due date from October 17 to September 3 prior to closing the CAR on Monday. I did not consider restoring the due date to October 17 as an "extension", but I recognize the reason why the company wishes to call it that.

V/r,
Larry

From: Criscione, Larry S.
Sent: Tuesday, August 28, 2007 8:05 PM
To: Neterer, David W.
Cc: Weekley, John R.; Milligan, James W.
Subject: Meeting Concerning Re-opening CAR 200702606

Dave,

I met with JR Weekley and Jim Milligan today at their request concerning my re-opening of CAR 200702606.

At the meeting, I was informed that re-opening CAR 200702606 was a step backward in my Performance Improvement Plan, particularly in the areas of Teamwork, Professionalism and Communications:

- Not contacting my supervisor prior to re-opening CAR 200702606 demonstrated disrespect.
- The substance of the actions I sent (Actions 5, 6 and 7) were "degrading" of Dave Lantz and John Patterson.
- Not contacting my supervisor prior to re-opening CAR 200702606 was an instance of not keeping "department leadership informed of issues."

At the meeting I was frequently interrupted by Jim so he could respond to statements I made. Whenever I attempted to interrupt Jim to address a point he was leaving, I was always told by him I needed to let him finish speaking. At that instance, he would continue to move on to a new point.

There were several times during the meeting when I was told by JR Weekley that he was not interested in my version of events or my opinion of matters.

I was told the purpose of the meeting was to help me improve my performance. I informed JR and Jim that I did not believe this to be the case.

At the meeting I requested copies of the notes being taken. JR and Jim refused to agree to that.

At the meeting I also requested that at the end of the meeting we would go over their notes so I could be sure I was not misquoted or misunderstood. JR and Jim refused to agree to that.

During the meeting I understood it to be implied I would be given a typed summary of the notes being taken by Jim Milligan and JR Weekley. At the end of the meeting, I was told it would be decided tomorrow as to whether or not I would be given a summary.

I informed JR and Jim that I intended to address not receiving copies of their notes at meetings with Fadi Diya. I was told I had to go through you first.

Here is my position:

1. I question the integrity of some individuals at Callaway Plant who are in my chain of command. I believe that some individuals within my chain of command are willing to misrepresent statements made by me to justify their actions. See item 6 below.
2. Regardless of item 1, I believe everyone who lives is capable of misunderstanding the statements of others. Since we are all fallible, we should use certain tools to help ensure better understanding. One such tool is to review the notes for any misunderstandings. This was done earlier in the summer at a meeting between me and Jim Milligan which was witnessed by Rich Eickelman. I do not understand why JR and Jim refused to review the notes at the end of our meeting.
3. I believe there are some individuals at Callaway Plant who wish to terminate my employment because they do not appreciate my willingness to pursue safety concerns which my supervisors wish to not address. I believe these individual have in the past conferred with company lawyers for advice on various "performance" issues regarding me. The purpose of the consultations with these lawyers was to ascertain whether or not the company had reason to terminate my employment.
4. My performance is no longer ever discussed "one on one". There is always another management person present. Often times, the "witness" is someone who may have a vested interest in Jim's version of events. JR Weekley is one such witness. This is intimidating to me. I worry that future recollections of meetings may not be entirely accurate. With two people who have a vested interest in misrepresenting me as the only attendees (aside from me), I am worried statements I make or my general demeanor may be improperly construed.

5. I can think of no legitimate reason why I should not be issued a copy of the hand written meeting notes (and also any summaries) for meetings involving my performance. I understand the company views these notes as their property; if these meetings are truly not meant for future termination justification, providing me a copy of the notes should not in any way induce liability upon the company. I would like to know the company's understanding of my statements, especially since the company always has two witnesses to collaborate on their version of statements made during the meeting. When I am meeting with two of my superiors, I find both not being provided copies of the meeting notes and not reviewing the meeting notes at the conclusion of the meeting to be intimidating.
6. In June 2005 I met with you and Bob Barton to discuss my Remediation Plan after I was not allowed to take the annual dynamic exam in May 2005. I genuinely accepted that meeting to be about improving my performance. During the meeting I admitted that I have a tendency to be blunt and am willing to confront issues directly. This on occasion caused personal conflicts. This admission was inaccurately documented (due to either an unintentional misunderstanding or an intentional misrepresentation) by you in a letter to me date June 28, 2007 as follows:

> *You acknowledged to both Bob Barton and me that your inability to work cooperatively with others, a principal element in the criticism from your crew, was a long-standing issue with you. You recognized that this conduct had been a performance issue during your service in the Navy, and continued during your employment at Clinton before you came to Callaway.*

   I do not have an "inability to work cooperatively with others." I can provide several examples to the company of projects I have participated on for which I was an integral team member and worked very well with the other team members. I also did not have a "performance issue during [my] service in the Navy [which] continued during [my] employment at Clinton". In both the Navy and at Clinton I occasionally conflicted with my superiors over issues I was attempting to address. At neither institution were these conflicts beneficial to my career, but sometimes doing what is right is more important than worrying about how one's inaction may be more beneficial to one's career.
7. I do not have the luxury of having a legal team review my emails and memos before sending them or approve my talking points before meetings. The company does. Although this is intimidating to me, I recognize there is nothing the company can do regarding this concern. I bring this up because I believe it has some bearing to item 9 below.
8. I do not have the authority to order the company to meet with me and to decide the time, place and attendance of the meeting. The company does have the authority to establish time, place and persons attending with regard to meetings involving my performance. I feel the scheduling of such meetings during my "off" hours may be used to inappropriately punish me for being willing to address safety concerns which the company would prefer to ignore.
9. In light of the above eight items, I request that in the future the company present concerns regarding my performance to me in writing. If I disagree with any of the stated concerns, I will document my version of events in writing to the company.
10. If item 9 is not feasible, I request that in the future, for meetings concerning my performance at which notes are taken and more than one person other than myself is present, I am provided the following consideration:
    a) A neutral witness is present to take notes. The following people are examples of "neutral" witnesses (some of whom have been used in the past): Pat Shannon, Rich Eickelman, Becky Penrod, Dave Hopkins, Gary Olmstead, Fred Bianco, Steve Ganz, Gary Schultz, Dave Hurt, Bruce Bredeman, Gary Hughes.
    b) The meeting notes are reviewed at the end of the meeting for accuracy.
    c) I am promptly provided a copy of the meeting notes at the end of the meeting.

If necessary, I would like to meet with you regarding the requests made in items **9 & 10** above. If you do not feel it is necessary to meet with me, I would like you to respond to my request. Depending on your answer, I intend to address the above items with Fadi Diya.

I have copied JR Weekley and Jim Milligan on this email. I request that they review my statements regarding our meeting earlier today for accuracy and inform me of any misstatements. Please recognize that my statements are in no way meant to be a complete account of the meeting. Any additional information that they feel is needed for clarity is appreciated.

Very respectfully,
Lawrence Criscione

Meeting on Criscione reopening CAR 200702606 1540 8/28/07

- JW: opened meeting indicating the meeting was about LC re-opening CAR 200702606.
- JW: clarified that this re-opening flagged as the 4th extension to this CAR.
- JW: the corrective action had been discussed with the originator and the RMRC.
- JW: LC assigned new actions, these actions were good questions, but were from 3 years ago and added no value to the issue.
- JW: JM has been trying to work with you on your performance when he was gone the week before last, he gave you lead on these CARS 200702606 and 200701278. Assigning you with these tasks of increased responsibility, and then you did not show up on that day.
- JW: When your supervisor or Dept head closes an issue you should discuss the issue with them before re-opening the issue.
- JW: This looks like a step back in your performance improvement plan, from where we were heading.
- JW: The actions you took, take away from the teamwork approach with Training and Outages.
- JW: I am not sure where you are at Larry, but you need to become a team player.
- JW: You have put your department in an awkward position by re-opening this CAR.
- JW: you need to talk with someone before you do something like this.
- JW: another individual in this department had a similar problem, this individual tried this approach and this helped him.
- JW: do you feel anything was gained from these actions?
- LC: yes these are high level questions.
- JW: we do not want you to lose your CAR access.
- JW: in the future when re-opening a CAR talk to your supervision.
- JW: is this clear?
- LC: I just want to clarify this doesn't apply to something simple from CAR screening I don't want to be nickel and dime'd on these issues.
- JW: this will be an issue at the Managers meeting.
- LC: I can go with you to that Mgr meeting.
- JW: That Is Not The Issue.
- LC: I can explain why I did this.
- JW: Do you see where this ties in?
- LC: Can I get photocopies of this meeting notes?
- JW: no but I will have Jim type these notes and deliver a copy to you.
- LC: I feel like I am being ganged up on.
- JW: you can take your own notes.
- LC: ya but my notes don't mean anything. I see no reason that you can't provide me a photocopy of these meeting notes.
- JM: Larry you need to focus on what we are saying, not what is being recorded in the notes. The notes are not as important as you understanding the message that "your performance needs to improve."
- JW: there are 4 things that you need to focus on:

- Teamwork
- Communications
- Respect
- How you present yourself.

- JW: These are the same words that are in the letter indicating that you would not be interviewed for the OS position.
- LC: I would like to talk about the re-opened CAR issue, was Gary asked before closing this CAR?
- JW: I talked with Gary about this issue when the CAR was written.
- LC: Was Gary asked before closing this CAR?
- JW: Larry the same issues surrounding this CAR are the same issues that Jim is working with you on, the same issues that Dave Neterer has stressed, the same items that are in your letter why you were not interviewed for the supervisory position. If you have a vendetta against someone this is not the way to pursue it.
- LC: that doesn't preclude Callaway from doing the right thing, about the reactivity issue.
- JW: What more do you want us to do? we followed your suggestions for the procedure.
- LC: I believe that if someone with an SRO license knew his crew lost control of the reactor and tried to cover it up, he should lose his license. If an RO makes a mistake and brings it up, that is ok, if an SRO tries to cover up this issue that requires action.
- JW: Then go ask those persons what happened.
- LC: I don't believe that I have a relationship with this person that would allow me to get an answer.
- JW: How do you expect this to improve your relationship with this individual?
- LC: Jim why did you close these actions?
- JM: Gary and you both indicated that with the procedure changes that have been made, you agreed that the issues with these CARs have been resolved. So I closed 200702606 to CAR 200701278.
- LC: I generated action 4 to CAR 200702606 last Friday, I found it closed this Monday, so I reopened the CAR and generated actions 5 and 6.
- JR: So Larry I want to review the items that we have discussed for you to continue to work on:
  - Teamwork
  - Respect
  - How you conduct yourself
  - Communications
- LC: I do not trust that these are meant to help me. Things that would go a long way to build that trust, would be if you reviewed the notes at the end of this meeting, and provided me a copy of your notes.
- JM: Larry these notes are not what is important for you to gain from this meeting. What is important is that you understand that we must see improvement in your performance and that is the reason for the Performance Improvement Plan.
- LC: those notes are important because you are going to use those notes to have me fired.

- JM: Larry my goal all along has been to help you become an Operating Supervisor with a license, but here is where you are and we have a long way to get you there, and the first step is to show improved performance under your Performance Improvement Plan. I am in a position to help you get to where you want to be. I am even involved with some of the interview processes. But it is true that if we do not see improved performance there will be consequences, you have been told that all along.
- LC: since you won't let me have a copy of these meeting minutes, I plan to talk with Fadi Diya about this, so I am letting you know this in accordance with my chain of command direction.
- JM: Larry what is your chain of command direction?
- LC: if I am unsatisfied with yours and JRs response then I can express my concerns to Fadi Diya.
- JM: Larry that is not correct, the first step is to come to your supervisor, explain to me your concern and we should work together to address your concern. If I can not address your concern, you let me know, give me an opportunity to address your concern, before going to JR. Then the same with JR, then with Dave Neterer. Before proceeding to the next step, you need to think about your issue, if you have gotten to this point without resolution you need to realize that you are in conflict with your departments top leadership. I can think of no reason for an issue to get to this point, in which an issue can not be resolved with our department leadership.
- JM: so Larry lets recap what you have gained from this meeting.
- LC: I now understand that
    - My department would like CAR 200702606 closed.
    - My department views me as out of line by re-opening this CAR and generating those actions.
    - These meetings are to improve my performance.
    - I need to talk with Dave Neterer before talking with Fadi Diya and that you are documenting a case to fire me.
- JM: Larry, I don't understand how we can spend this much time discussing the specific areas for your performance improvement, and you respond with those items. I am trying to help you improve your performance so that you can become an Operating Supervisor with a license. I cant change your performance you need to change your performance.
- LC: Do you think that I can trust you?
- JM: I don't know, but you should because I am spending 90% of my work time trying to help you improve your performance.
- LC: I don't think that I can trust you, because you are just using these notes to build a case to fire me.
- JM: Do you trust JR?
- LC: I don't know yet.
- JM: Larry JR is spending a significant amount of his time trying to help you improve your performance. Tell JR what you got from this meeting.
- LC:
    - I re-opened 200702606 and Ops dept considers this inappropriate.
    - This action goes against teamwork, respect, and communication
    - We reviewed my chain of command actions.

- JM: so Larry you recognize that your actions go against teamwork, respect and communications. This is what YOU got out of this meeting?
- LC: no, just that my management thinks my actions go against these items.
- JR: Larry, these are the same issues that were stated in the letter explaining why you were not interviewed for the Operating Supervisor position. These people tried to help you before, with a performance plan, just like we are trying to do now. You do good for a while and then slip again.
- LC: what was in that letter was all untruths.
- JR: Larry it doesn't matter.
- JR: I don't know what to do. We have been trying to help you. We told you 8 months ago you have new mgmt a clean slate all you have to do is work with us.
- LC: I can tell you what to do.
- JR: NO, I don't need you telling me what I have to do. YOU need to make the change. These are the final words and then this meeting is over and I don't need a recap. You need to leave here tonight and decided what you are going to do. This meeting is over.

1 I did not exclude Dave Neterer from this part of the discussion. Although I had already discussed this issue with Dave, I had not told him I was going to Fadi.

2 This is not an accurate quote. There are significant mis-representations in the letter dtd June 28, 2007 from Dave Neterer to me. I conveyed that to Jim & JR. I do not remember my exact words, but it was not the curt dismissal rendered above.

3 At this point in the discussion, the topic was about trust. There is missing dialogue, either in that attributed to me, or in that attributed to JR immediately above. The meaning conveyed was "I can tell you what to do to gain my trust."

Larry Criscione

From: Criscione, Larry S.
Sent: Wednesday, August 29, 2007 8:33 AM
To: Olson, Eric C.; Rickard, Donald E.
Cc: Heflin, Adam C.; Diya, Fadi M.; Neterer, David W.; Weekley, John R.; Milligan, James W.; Olmstead, Gary W.
Subject: Extension of CAR 200702606

Eric and Don,

It has been brought to my attention that at the Manager's meeting yesterday there was a discussion involving the extension of CAR 200702606. Specifically, Sig 3 CAR 200702606 was extended a fourth time without receiving Mr. Heflin's approval.

Gary Olmstead wrote CAR 200702606 on March 20, 2007 and it was screened on March 21. To ensure CAR 200702606 was evaluated in 30 days, the Screening Committee assigned a due date of April 20, 2007.

On April 19, Jim Milligan extended the due date from April 20, 2007 to June 14, 2007. My understanding of the software is that since the CAR was still in Evaluate, this extension did not cause the extension counter to increase.

On April 30, Jim Milligan changed the status of CAR 200702606 from Evaluate to InProcess.

On June 8, Jim Milligan extended the due date from June 14 to July 26, 2007. This caused the extension counter to advance to 1.

On July 25, JR Weekley changed the due date from July 26 to August 17, 2007. This caused the extension counter to advance to 2.

After I had left for the day on August 15, Jim Milligan changed the Lead of CAR 200702606 from himself to me. This was done because I was supposed to represent CAR 200701278 at CARB for Operations on August 16 when Jim had a vacation day. I was ill August 16 and missed work. On August 16, JR Weekley changed the due date from August 17 to October 17, 2007. This caused the extension counter to advance to 3.

On August 24 I initiated Action 4 on CAR 200702606. I did not send this action because I was awaiting comment from the CAR originator.

On August 27 Jim Milligan restored himself as the Lead for CAR 200702606 and deleted the action I was drafting (Action 4 at the time). At 1021 Action 4 was sent as a Management Close Review action. At 1024 the due date was changed from October 17 to September 3, 2007 by Jim Milligan; I do not know the reason for this change. It does not appear that this change registered on the counter. I am unfamiliar with the software code; I assume the counter did not register the change either because the change was to an earlier date or because the CAR was at status PendingClose. At 1141 Jim Milligan changed the status of CAR 200702606 to Closed.

Around noon on Monday I received feedback from the originator of CAR 200702606. He had reviewed the action I was intending to send (original Action 4) and indicated it was acceptable. When I later attempted to send the action, I realized CAR 200702606 had been closed. At 1258 on August 27 I re-

opened CAR 200702606, changed the Lead from Jim Milligan to me and sent my actions (originally written as Action 4) as Actions 5 and 6. In order to provide a reasonable due date for Actions 5 & 6 (September 3 is Labor Day), I returned the due date to October 17, 2007, causing the counter to advance to 4.

Since October 17, 2007 was the due date given to the CAR on August 16, I respectfully request that the counter for CAR 200702606 be restored to 3.

I recognize my action of re-opening CAR 200702606 on Monday, August 27 may not have been the most prudent career choice for me. I am willing to discuss my actions with anyone at Callaway Plant who is interested. If you receive any questions regarding my actions, please refer the individuals to me.

Thank you,
Larry Criscione

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TAB 1A

Drop-In Visit Agenda
August 13, 2010

ITINERARY

TIME	PERSON VISITED	CONTACT PERSON	PHONE
1:00 p.m. – 2:00 p.m.	William Borchardt, EDO; Marty Virgilio, DEDR, and Michael Weber, DEDMRT	Renee Taylor	(301)415-1700

VISITORS REPRESENTING CALLAWAY PLANT

- Mr. Adam C. Heflin, Senior Vice President and Chief Nuclear Officer

TOPICS OF DISCUSSION (Provided by Union Electric Company)

- 2003 Reactivity Management Event of Inadvertent Passive Shutdown; Exchange Perspectives; Confirm they are doing everything they can
- Mitigating System Performance Index (MSPI) Emergency AC Power
- Refuel 17 Control Rod Issue
- Safety System Functional Failures (SSFF)
- Security Rule (Physical and Cyber)
- Callaway Plant, Unit 1 Plant Performance
- New Plant Status

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