

**NRC HANDLING OF ISSUES RELATED TO  
REFUELING OPERATIONS AT MILLSTONE UNIT 1**

CASE NO. 96-05S 7/23/96

**OFFICE OF THE INSPECTOR GENERAL  
EVENT INQUIRY**



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REFUELING OPERATIONS AT MILLSTONE UNIT 1**

**CASE NO. 96-05S**

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**Gregory Goneconto, Special Agent**

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**Rossana Raspa, Team Leader**

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**Robert A. Watkins  
Acting Assistant Inspector General  
for Investigations**

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## CHRONOLOGY OF SIGNIFICANT EVENTS

<u>Date</u>	<u>Event</u>
10/18/93	NU submits LER 93-11 and advises the NRC that conditions may have existed where the Millstone Unit 1 spent fuel pool cooling system may have been incapable of maintaining pool temperature below the 150° Fahrenheit (F) design limit.
1/24/94	Millstone Unit 1 shutdown to begin refueling outage 14.
4/22/94	NRC issues inspection report 50-245/94-01 addressing LER 93-11 and refueling outage 14.
4/26/94	George GALATIS, a senior NU engineer, contacts NRC with numerous allegations, including spent fuel pool cooling at Millstone Unit 1.
5/6/94	OI initiates an evaluation based on GALATIS' allegations.
6/30/94	NU submits revision 8 to the Millstone Unit 1 Final Safety Analysis Report (FSAR).
8/15/94	NRC issues inspection report 50-245/94-201 addressing LER 93-11.
8/28/94	OI interview of GALATIS.
10/31/94	OI upgrades its investigation of GALATIS' allegations from an evaluation to a full scale investigation.
5/19/95	Second OI interview of GALATIS, with Region I project engineer present.
7/28/95	NU submits license amendment request to the NRC to Allow for full core offloads as a normal end of cycle event at Millstone Unit 1.
8/21/95	Petition filed by Attorney Ernest HADLEY on behalf of GALATIS and We the People, Inc. pursuant to 10 CFR Part 2.206. Petition maintained that NU "knowingly, willingly, and flagrantly operated Millstone Unit 1 in violation of its operating license for approximately 20 years..."
8/28/95	Supplement to the 10 CFR Part 2.206 petition filed by HADLEY.
8/28/95	OIG initiates investigation (95-77I) based on information in GALATIS' 10 CFR Part 2.206 petition.

8/29/95 OI's investigation of GALATIS' allegations is upgraded to high priority status.

9/1/95 NRC issues inspection report 50-245/95-28 addressing refueling practices at Millstone Unit 1.

9/12/95 NU submits additional information to support license amendment request.

9/13/95 OIG interview of GALATIS.

9/22/95 NRC's Office of Nuclear Reactor Regulation (NRR) completes its Safety Evaluation of NU's license amendment.

10/2/95 NRC's Division of System Safety and Analysis, NRR, completes its review of safety and licensing issues associated with Millstone Unit 1 full core offloads.

10/11/95 NU letter is issued advising the NRC that installation of cross-tie connection from the shutdown cooling system to the spent fuel pool cooling system was completed and that NU planned to conduct a full core offload for refueling outage 15.

10/11/95 Second OIG interview of GALATIS.

10/13/95 NRC issues first Request for Additional Information (RAI) to NU.

10/18/95 NU responds to first RAI.

10/20/95 NRC issues second RAI to NU.

10/23/95 NU responds to second RAI.

10/23/95 NU letter is issued stating that a full core offload for upcoming refueling outage would take place upon issuance of an amendment or NRC notification to proceed under the provisions of 10 CFR Part 50.59.

10/26/95 NRC verbally advises NU that the license amendment would not be issued by 10/27/95.

10/26/95 NU changes its scheduled refueling outage date to 11/3/95.

10/30/95 NRC issues third RAI to NU.

10/31/95 NU responds to third RAI.

11/2/95 NU advises NRC of plans to commence outage on 11/3/95 and await the amendment.

11/3/95 NU commences shutdown for refueling outage 15.

11/6/95 NRC's Division of Systems Safety and Analysis completes its review of the license amendment.

11/8/95 NRC public meeting is held at Waterford, Connecticut Town Hall.

11/8/95 NRC Region I forwards results of inspections of cross-tie modification to the NRR Director.

11/9/95 NRC issues license amendment no. 89 to NU.

3/12/96 Third OIG interview of GALATIS.

## EXECUTIVE SUMMARY

This Office of the Inspector General (OIG), U.S. Nuclear Regulatory Commission (NRC) event inquiry was initiated based on concerns by Northeast Utilities (NU) Senior Engineer George GALATIS and his attorney, Ernest HADLEY, about the NRC's handling of issues associated with refueling practices and the operation of the spent fuel pool at the Millstone Nuclear Power Station, Unit 1. The issues pertaining to NU's refueling practices were first identified by GALATIS who notified NU management in 1992 that the practice of offloading the full core during refueling outages was outside the Millstone Unit 1 design basis and a violation of the Millstone Unit 1 operating license. The design basis issue was previously addressed by OIG in event inquiry 95-77I, dated December 21, 1995.

During this event inquiry, OIG reviewed how and when the NRC addressed the safety concerns raised by GALATIS. To accomplish this, OIG examined documents relevant to GALATIS' allegations such as NRC inspection reports. OIG also interviewed NRC staff and licensee employees who worked to address these health and safety issues.

OIG determined that there were delays by the NRC in addressing technical concerns raised by GALATIS. Further, OIG determined that Region I technical staff did not interview GALATIS about his April 26, 1994, allegations regarding NU's operation of the spent fuel pool at Millstone Unit 1. The only interview of GALATIS involving a member of the NRC technical staff took place on May 19, 1995, when a Region I project engineer provided technical assistance during an NRC Office of Investigations (OI) interview.

OIG learned that the concerns raised by GALATIS to NU management resulted in issuance of a Licensee Event Report (LER 93-11), dated October 18, 1993. In this LER, NU indicated that it typically performed full core offloads during refueling outages at Millstone Unit 1. NU also described a full core offload scenario that was beyond the design basis of the plant. At the time of LER 93-11, Millstone Unit 1 had conducted 13 refueling outages.

OIG determined that subsequent NRC inspection reports 50-245/94-01 (94-01) and 50-245/94-201 (94-201), issued in April and August 1994, respectively, did not thoroughly address the issues reported by NU in LER 93-11. However, these inspection reports were intended by the NRC to resolve the issues in LER 93-11. Documents reviewed and testimony obtained by OIG during this event inquiry indicated that Region I would have closed these issues had GALATIS not pursued his allegations related to NU's refueling practices at Millstone Unit 1 by filing a 10 CFR Part 2.206 petition with the NRC in August 1995.

In this event inquiry, OIG also reviewed the NRC's handling of NU's July 28, 1995, request to amend the Millstone Unit 1 operating license to allow full core offloads as a normal event during refueling outages. OIG found no improprieties by NRC staff with respect to the approval of NU's license amendment request.

## **BASIS**

This Office of the Inspector General (OIG), U.S. Nuclear Regulatory Commission (NRC) event inquiry was initiated based on concerns by Northeast Utilities (NU) Senior Engineer George GALATIS and his attorney, Ernest HADLEY, about the NRC's handling of issues associated with refueling practices and the operation of the spent fuel pool at the Millstone Nuclear Power Station, Unit 1. The issues pertaining to NU's refueling practices were first identified by GALATIS who notified NU management in 1992 that the practice of offloading the full core during refueling outages was outside the Millstone Unit 1 design basis and a violation of the Millstone Unit 1 operating license.

On October 11 and 12, 1995, OIG interviewed GALATIS in connection with his allegation that NRC staff allowed NU to perform full core offloads knowing that this practice was outside the Millstone Unit 1 design basis and a violation of its operating license. This issue was the subject of OIG event inquiry 95-77I, dated December 21, 1995.

During the OIG interview, GALATIS and HADLEY provided information which formed the basis for this event inquiry and resulted in a subsequent interview on March 12, 1996. When interviewed, GALATIS and HADLEY expressed strong concern about the way the NRC and NU were addressing problems with refueling practices at Millstone Unit 1.



## **SCOPE**

In order to address the concerns raised by GALATIS and HADLEY, OIG reviewed the following: (1) the NRC's handling of allegations which GALATIS made to the NRC on April 26, 1994; (2) the NRC's handling of a Licensee Event Report (LER 93-11) that NU submitted to the NRC on October 18, 1993; and (3) the NRC's handling of a license amendment request that NU submitted to the NRC on July 28, 1995.

In addition to OIG interviews of GALATIS and NRC staff, including the Millstone Unit 1 project manager, Senior Resident Inspector and NRC managers, OIG reviewed the following documents related to the GALATIS/HADLEY concerns:

- ! Licensee Event Report 93-11;
- ! Revision 8 to the Millstone Unit 1 FSAR;
- ! NRC inspection reports relevant to the refueling practices/spent fuel pool issues;
- ! Previous OIG and OI interviews of GALATIS;
- ! Previous OIG interviews of NRC staff;
- ! NRC files pertaining to GALATIS' allegations;
- ! NU's July 28, 1995, license amendment request and supporting documents;
- ! NRC reviews and reports relating to NU's license amendment request.

## **BACKGROUND**

In 1992, NU Senior Engineer George GALATIS raised the issue of improper refueling practices at Millstone Unit 1. GALATIS notified his management that NU's practice of offloading the full core during normal refueling outages at Millstone Unit 1 was outside design basis assumptions in the Millstone Unit 1 Final Safety Analysis Report (FSAR) and a violation of the plant's operating license.

As a result of GALATIS' concerns, NU commissioned an independent engineering analysis of the Millstone Unit 1 spent fuel pool to determine its ability to adequately remove heat generated under various scenarios. Under normal refueling operations, the design limit of the spent fuel pool was 150°F. However, NU's analysis identified a situation where the temperature in the spent fuel pool could reach 216°F following a single failure loss of a shutdown cooling system pump. This situation involved a full core offload beginning 150 hours after shutdown.

[NOTE: A single failure is defined as an occurrence which results in the loss of capability of a component to perform its intended safety function. With respect to spent fuel pool cooling, Section 9.1.3. of the NRC's Standard Review Plan (SRP), dated July 1981, included provisions that there be no loss of function as a result of a single active failure or failures to nonsafety-related components or systems during normal refueling conditions.]

As a result of the independent engineering analysis, NU submitted Licensee Event Report 93-11 (LER 93-11) to the NRC on October 18, 1993. NU reported that in the event of a failure of a shutdown cooling system pump, the spent fuel pool cooling system may have been incapable of maintaining the temperature of the pool below the 150°F design limit. NU reported that this refueling scenario involved a full core offload beginning 150 hours after reactor shutdown. NU reported this event as a condition that was outside the design basis of the plant.

In LER 93-11, NU also reported that the Millstone Unit 1 FSAR described a "normal" refueling sequence as the removal of one-third of the core to the spent fuel pool. However, NU added that its practice during normal refueling outages had been to remove the full core. According to the FSAR, a full core offload was only used during an "emergency" refueling sequence.

On July 28, 1995, NU submitted a license amendment request to the NRC seeking approval to conduct full core offloads as a normal event during refueling outages at Millstone Unit 1. NU requested that the NRC's review of the amendment request be accelerated to support the refueling outage scheduled for October 13, 1995.

The requested license amendment sought NRC approval to change NU's technical specifications for refueling and spent fuel pool handling. To support this, NU planned to install a cross-tie between the two pumps of the shutdown cooling system. The modification would enable NU to take credit for the capability of both shutdown cooling system pumps to provide additional cooling to the spent fuel pool cooling system. In the event of a single active failure of a shutdown cooling pump under the new, normal full core offload scenario, NU would still have the use of one shutdown cooling system pump and the spent fuel pool cooling system pumps. This would provide the necessary cooling to the spent fuel pool and maintain pool temperature

within limits.

NU's license amendment request stated that the cross-tie modification would be installed under the provisions of 10 CFR 50.59, while NRC approval would be requested to permit a "full core offload as a normal core offload scenario." On October 11, 1995, NU reported to the NRC that the cross-tie modification had been completed.

On August 21, 1995, Attorney Ernest HADLEY filed a petition with the NRC on behalf of GALATIS and We the People, Inc. pursuant to 10 CFR Part 2.206. The petition requested that NU's operating license for Millstone Unit 1 be suspended for 60 days and that NU's request for a license amendment be denied. In the petition, GALATIS and We the People, Inc. contended that NU "knowingly, willingly and flagrantly operated Millstone Unit 1 in violation of its operating license for approximately 20 years." The petitioners contended that NU operated Millstone Unit 1 in violation of license amendments 39 and 40 by offloading all 580 fuel assemblies into the spent fuel pool during refueling outages.

Beginning in October 1995, the NRC issued the first of several Requests for Additional Information (RAIs) to NU to assist in the staff's review of the proposed license amendment. Based on information provided by NU in response to these RAIs and, as a result of several internal reviews by the staff, the NRC issued license amendment 89 for Millstone Unit 1 on November 9, 1995.

The license amendment added a license condition to NU's operating license, as opposed to the requested change of technical specifications. The amendment allowed NU to conduct full core offloads as a normal event during refueling outages at Millstone Unit 1.

## DETAILS

### **I. NRC's Handling of George GALATIS' Allegations**

On April 26, 1994, GALATIS telephonically contacted the Region I Allegation Coordinator and provided him with several allegations. In addition to allegations related to NU's refueling practices and operation of the spent fuel pool at Millstone Unit 1, GALATIS provided allegations related to containment isolation valves, the turbine building closed cooling water system and reactor vessel head stud detensioning. These allegations were documented in a Region I Allegation Receipt Report and in a June 20, 1994, letter to GALATIS. The corresponding Region I Allegation Disposition Record, dated May 31, 1994, indicated that the Millstone Unit 1 Senior Resident Inspector (SRI) would meet with GALATIS to assess only his questions regarding the scope of a June 1994 NRC inspection on an unrelated technical concern.

OIG reviewed the Region I allegation file (RI-94-A-0090) which contained information pertaining to GALATIS's April 26, 1994, allegations. This review identified information related to NU's refueling practices which GALATIS provided to the Millstone Unit 1 Resident Inspector in June 1995. The file also contained documents memorializing conversations between Region I staff and GALATIS in June 1995. In one of these documents, dated June 20, 1995, the Millstone Unit 1 SRI indicated that GALATIS planned to contact his lawyer "to determine what he could do to escalate these issues in order to move them along at a faster pace." The SRI added that GALATIS used the term "go public with the issues."

On June 2, 1994, the Millstone Unit 1 SRI met with GALATIS. The handwritten notes taken by the Millstone Unit 1 SRI during this meeting indicated that GALATIS discussed his concerns with Millstone Unit 1 operations and management in the following areas: (1) procedural adherence; (2) operational conceit; (3) management integrity; and (4) NRC not enforcing its regulations pursuant to 10 CFR Parts 50.5, 50.7 and 50.9. The SRI's notes did not contain any information indicating that GALATIS was questioned regarding his technical concerns with NU's refueling practices and the operation of the spent fuel pool at Millstone Unit 1. Nevertheless, the SRI indicated in his notes that he "heard no specific new technical concerns." The SRI also indicated in his notes that GALATIS had a large amount of documentation to support his concerns and that GALATIS wanted to arrange a meeting, with a court reporter present, to transfer these documents to the NRC.

A handwritten NRC memorandum from a Region I Branch Chief in the Division of Reactor Projects (DRP) was attached to the SRI's notes which indicated that the interview of GALATIS did not identify any new technical concerns and that a transcribed interview of GALATIS should take place. The Branch Chief wrote that, "I don't see much to go on here, other than his [GALATIS'] opinions."

In the June 20, 1994 letter, Region I described GALATIS' allegations in essentially the following manner: LER 93-11 was misleading; NU management tried to misdirect him from raising concerns related to the spent fuel pool; NU deliberately attempted to deceive the NRC in

information they submitted; and since 1976, Millstone Unit 1 routinely performed full core offloads that were outside the plant design basis.

GALATIS was subsequently interviewed by an NRC Office of Investigations (OI) investigator on August 28, 1994. The OI investigator documented his interview of GALATIS in a Report of Interview. During his interview, the OI investigator focused on GALATIS' wrongdoing allegations with respect to NU's refueling practices and NU's operation of the spent fuel pool at Millstone Unit 1.

On May 19, 1995, the OI investigator conducted a transcribed interview of GALATIS. A Region I project engineer participated in this interview to provide technical assistance to OI. The project engineer acknowledged to OIG that, at the request of the OI investigator, he participated in the interview to assess GALATIS' technical issues. OIG found no record indicating that NRC technical staff independently interviewed GALATIS about his concerns with the refueling practices and the operation of the spent fuel pool at Millstone Unit 1.

[NOTE: NRC staff interviewed GALATIS in September 1995 as part of a special NRC inspection into NU's employee concerns program.]

With respect to GALATIS' technical allegations, the Region I project engineer who assisted OI told OIG that there "hadn't been that much focus on wrapping them all up and closing them out." The project engineer stated this approach changed in about April 1995 as GALATIS became more active in pursuing his allegations with the NRC. The Region I project engineer opined that GALATIS "was probably frustrated with the lack of seeing some wrap up answers on issues that he brought us."

The project engineer added that towards the end of May 1995, a Region I Branch Chief was, "eager to start pursuing wrapping up George's [GALATIS] issues because he had been so persistent in pursuing some of these concerns and he [Region I Branch Chief] was worried about it blowing up into something bigger, I think."

The Region I project engineer drafted a memorandum to the OI investigator, dated June 15, 1995, documenting his review of the transcript from the May 19, 1995, interview of GALATIS. As a result of his review, the project engineer identified eight issues, including technical concerns and wrongdoing allegations associated with the Millstone Unit 1 spent fuel pool. The project engineer acknowledged in his memorandum that additional technical inspections by Region I were warranted with respect to GALATIS' technical concerns.

In his memorandum, the Region I project engineer also commented on whether OI should pursue an investigation based on GALATIS' allegations. The project engineer wrote that "OI may be best advised to open a case at this time even with the limited evidence provided since this matter will not be resolved and go away otherwise." The project engineer added that GALATIS is "seemingly technically credible and he strikes me as someone with great tenacity."

On November 15, 1995, the Region I Allegation Coordinator sent GALATIS a letter which referred to the 10 CFR Part 2.206 petition that GALATIS submitted on August 21, 1995. This

letter informed GALATIS that, "The NRC staff is in the process of evaluating the petition. As a result, the NRC's evaluation [of] your original concerns regarding the Unit 1 spent fuel pool including the enforcement of NRC regulations in this area will be addressed in, or await the issuance of, the Director's Decision in this matter."

## **II. NRC's Handling of Licensee Event Report 93-11**

On October 18, 1993, NU submitted Licensee Event Report 93-11 (LER 93-11) to the NRC. NU reported that the spent fuel pool cooling system may have been incapable of maintaining temperature in the pool below the 150°F design limit. This scenario involved a single active failure to the shutdown cooling system pump during a full core offload beginning 150 hours after reactor shutdown. NU reported this event as a condition that was outside the design basis of the plant.

In the LER, NU reported that the Millstone Unit 1 Final Safety Analysis Report (FSAR) described a "normal" refueling sequence as the removal of one-third of the core to the spent fuel pool. However, NU indicated in the LER that its practice during normal refueling outages was to remove the full core. This practice was an "emergency" refueling sequence according to the FSAR.

As corrective actions, NU committed to revising the Millstone Unit 1 FSAR along with the design basis documents to reflect actual normal refueling practices and the results of analyses associated with these practices. NU also stated that "schedular and/or procedural controls" would be established so that cooling system capabilities and plant design limits would not be exceeded. NU committed to take all these actions prior to refueling outage 14 which was scheduled to begin in January 1994.

On April 22, 1994, Region I, NRC, issued inspection report 50-245/94-01 (94-01) which addressed LER 93-11 and refueling outage 14 that began on January 24, 1994. The inspection report stated that NU planned to utilize administrative controls during refueling outage 14 to ensure that spent fuel pool temperatures remained within design parameters, "given a failure of a spent fuel pool cooling pump." The NRC did not issue any violations with respect to LER 93-11.

OIG reviewed the NU special procedure (94-1-7) that was implemented for refueling outage 14. This procedure allowed for a full core offload while crediting only the spent fuel pool cooling system and adhering to design basis and license amendment commitments. The procedure called for a two-phase core offload incorporating a hold time after the initial third of the core was removed and before the remaining two-thirds were removed. The hold time was necessary to maintain pool temperature below 150°F in the event of a single active failure to the spent fuel pool cooling system under maximum heat load conditions.

OIG also reviewed NU's revision to the Millstone Unit 1 FSAR, dated June 30, 1994. NU specifically referred to refueling outage 14 and special procedure 94-1-7. However, NU did not revise the FSAR to reflect the actual practice used to perform full core offloads during normal refueling outages.

NU special procedure 94-1-7 was the only corrective action taken by NU prior to refueling outage 14, and Region I concluded in inspection report 94-01 that NU's corrective actions with respect to LER 93-11 were adequate. However, this conclusion did not account for NU's commitment in LER 93-11 to revise the Millstone Unit 1 FSAR to reflect actual normal refueling practices prior to refueling outage 14. In LER 93-11, NU committed to take all corrective actions prior to refueling outage 14.

When interviewed by OIG, the Millstone Unit 1 Resident Inspector involved with inspection 94-01 indicated that he was aware of LER 93-11 prior to performing the inspection. With respect to inspection 94-01, the Resident Inspector stated that, "I was aware at the time period that...in previous outages they were moving fuel, but it was not in conformance with their FSAR..." The Resident Inspector added that the Millstone Unit 1 FSAR provided for full core offloads during emergency situations but not as a normal practice.

The Resident Inspector indicated that during inspection 94-01 he followed-up on what he thought were the significant issues of concern in LER 93-11. The Resident Inspector stated that one concern was that NU had been performing full core offloads when their safety analysis required them to perform one-third core offloads. He explained that he did not attempt to determine what NU had done in the past because, at the time, he did not see that as being important. He said he was more concerned with determining whether there were any health and safety implications and if the issue was safety significant. The Resident Inspector stated that NU was not cited for a violation because the issue was self-identified, of low safety significance, and adequate corrective action was taken to minimize event recurrence.

On August 15, 1994, the NRC issued inspection report 50-245/94-201 (94-201) documenting the results of an engineering inspection at Millstone Unit 1 by the Special Inspection Branch, Office of Nuclear Reactor Regulation (NRR). Section 5.8.1 of this inspection referred to LER 93-11 and the NU special procedure that was implemented for refueling outage 14. The report indicated that, "The team reviewed the LER, the special procedure, and the licensee's internal memoranda on this issue, and concluded that the licensee's actions were acceptable." The report added that, "The licensee currently plans to develop a long term solution as part of a spent fuel storage reracking planned for 1997."

OIG discussed with the Region I Administrator the fact that inspection reports 94-01 and 94-201 appeared to close out the issues in LER 93-11. The Regional Administrator told OIG that this suggested that the staff had not done the kind of job expected of them.

The Region I DRP Director told OIG that, following GALATIS' 10 CFR Part 2.206 petition, he was asked by the Regional Administrator to develop a chronology of what the region did with respect to LER 93-11. The DRP Director explained that following GALATIS' petition there was a lot of NRC concern "relative to what did we do and what does the record show." The DRP Director acknowledged to OIG that the handling of LER 93-11 "may have been something in hindsight that we could have done better."

With respect to refueling outage 14, the Region I DRP Director told OIG that "at least based on

the inspections we had done up until this 2.206 that came in, I didn't believe that we had done enough detailed inspection to show for example that what they [NU] actually did ... was safe."

When interviewed by OIG, the DRP Branch Chief indicated that he was aware of LER 93-11 when it was submitted in October 1993. The Branch Chief stated that he routinely reviewed all LERs. With respect to LER 93-11, the Branch Chief stated that, "Unit 1 was operating full power, I mean they weren't off loading the core, so it wasn't something to get real excited about at the time."

The Branch Chief added that, "Because the licensee found some problem, it didn't sound like a big problem to me to begin with, and they were going to do something to fix it, so, and they reported it. So they met all my requirements for not getting real excited about it."

The Branch Chief indicated that inspection report 94-01 would have closed out the issues in LER 93-11. According to this Branch Chief, administrative procedures established by NU for refueling outage 14 adequately resolved the issues identified in LER 93-11. However, the Branch Chief acknowledged that the issues in LER 93-11 were not closed because, "Mr. GALATIS has brought this to a newer level I guess. I still do not think, you know, there may be some irregularities here, there may be some violations, but I do not think this is a most safety significant issue to be dwelling on..."

The Branch Chief added that, "They screwed up, they were doing something that wasn't described well in their FSAR. I don't think it was significant to assign a follow-up item to make sure that the FSAR got updated. You know its something, you've got to trust somebody sometime."

On September 1, 1995, Region I, NRC, issued inspection report 50-245/95-28 (95-28). Although this inspection report was issued almost two years after LER 93-11 was submitted, it, like inspection reports 94-01 and 94-201, also addressed LER 93-11. However, unlike these previous inspection reports, inspection report 95-28 documented a review of NU's past refueling practices at Millstone Unit 1. The report indicated that refueling outages 12 and 13 utilized full core offloads and that refueling outages 1 through 11 most likely involved full core offloads. The report concluded that license amendments 39 and 40 "did not completely and accurately describe the refueling activities as they were conducted." The inspection report added that NU's practice of performing full core offloads as a normal refueling operation, including the sequential process implemented during refueling outage 14, may have been conducted outside the Millstone Unit 1 FSAR. The inspection report added that although no conclusions were reached with respect to the safety significance of the issues identified in LER 93-11, a final agency decision in response to GALATIS' 10 CFR Part 2.206 petition would be forthcoming.

### **III. NRC's Handling of NU's License Amendment Request**

On July 28, 1995, NU submitted a license amendment request seeking NRC approval to perform full core offloads as a normal event during refueling outages at Millstone Unit 1. NU requested that the NRC perform an accelerated review of the amendment to support a scheduled refueling outage date of October 13, 1995.



The license amendment requested a change to the Millstone Unit 1 technical specifications for refueling and spent fuel pool operations. To support this request, NU planned to modify the spent fuel pool cooling system by installing a cross-tie modification to the B train of the shutdown cooling system. The modification would enable NU to take credit for the capability of both shutdown cooling system pumps to provide cooling to the spent fuel pool cooling system. Under the new full core offload scenario, NU would still have the use of one shutdown cooling system pump in the event of a single active failure of one shutdown cooling system pump. This would provide the necessary cooling to the spent fuel pool and maintain pool temperature below the limit in the technical specifications.

NU's license amendment request stated that the cross-tie modification would be installed under the provisions of 10 CFR 50.59, while NRC approval would be requested to permit a "full core offload as a normal core offload scenario."

The Plant Systems Branch, NRR, completed a safety evaluation of the license amendment and issued a Safety Evaluation Report (SER) on September 22, 1995. The results of this safety evaluation were that NU adequately addressed the issues relating to the increased heat load in the spent fuel pool that resulted from performing full core offloads.

An assessment of the issues related to full core offloads at Millstone Unit 1 was also performed by the Deputy Director, Division of System Safety and Analysis, NRR. The resulting October 2, 1995, report concluded that the level of detail in NU's license amendment request was inconsistent with NRC requirements and guidance on the content of technical specifications. The report also questioned NU's 10 CFR Part 50.59 process with respect to the cross-tie modification based on conflicting information from NU as to whether or not it involved an unreviewed safety question.

On October 13, 1995, the NRC issued to NU the first of three Requests for Additional Information (RAIs) relating to the proposed license amendment. The NRC issued the remaining RAIs to NU on October 20, 1995 and October 30, 1995.

A portion of the October 13, 1995, RAI involved NU's 10 CFR Part 50.59 evaluation for the cross-tie modification. Specifically, the NRC requested: technical information and the safety evaluation supporting the modification; a summary of procedural changes supporting NU's refueling operations; supporting 10 CFR Part 50.59 evaluations; and NU's basis for concluding that NRC approval in the form of a license amendment was required to perform full core offloads and not for making the physical modification to the plant.

On November 6, 1995, the Reactor Systems Branch of the Division of Systems Safety and Analysis, NRR, issued a SER on the possibility of an interfacing-system loss-of-coolant accident (ISLOCA) resulting from the cross-tie modification aligning the shutdown cooling system to augment the spent fuel pool cooling system. The safety evaluation concluded there was a reasonable assurance against the possibility of an ISLOCA in these two systems due to Millstone Unit 1 design feature, operator actions and administrative controls.

OIG learned that Region I also performed an inspection of the cross-tie modification and issued

its findings to NRR on November 8, 1995. The Region I inspectors "walked-down" the modification on October 26, 27 and November 3, 1995, and confirmed that it had been installed and pressure tested.

On November 9, 1995, the NRC approved NU's license amendment. Instead of changing the Millstone Unit 1 technical specifications as requested by NU, the NRC added a license condition to the Millstone Unit 1 operating license. The amendment allowed NU to perform full core offloads as a normal event during refueling outages in accordance with controls that NU provided to the NRC in its July 28, 1995, license amendment request.

## OIG FINDINGS

1. OIG determined that Region I technical staff did not interview GALATIS about his April 26, 1994, allegations regarding NU's operation of the spent fuel pool at Millstone Unit 1. The only interview of GALATIS involving a member of the NRC technical staff took place on May 19, 1995, when a Region I project engineer provided technical assistance during an OI interview concerning GALATIS' allegations of NU's intentional wrongdoing.
2. OIG determined that NRC inspection reports 94-01 and 94-201, issued in April and August 1994, respectively, did not thoroughly address the issues reported by NU in LER 93-11. However, these inspection reports were intended by the NRC to resolve the issues reported in LER 93-11. Documents reviewed and testimony obtained by OIG during this event inquiry indicated that Region I would have closed these issues had GALATIS not pursued his allegations related to NU's refueling practices at Millstone Unit 1 by filing a 10 CFR Part 2.206 petition with the NRC in August 1995.
3. OIG found no improprieties or evidence of intentional wrongdoing by NRC staff with respect to the approval of NU's license amendment request.