



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

March 26, 2010

EA-2010-039

Randall K. Edington,
Executive Vice President, Nuclear
and Chief Nuclear Officer
Mail Station 7602
Arizona Public Service Company
P.O. Box 52034
Phoenix, AZ 85072-2034

SUBJECT: NRC INSPECTION REPORT 50-528/10-09; 50-529/10-09; 50-530/10-09;
72-44/07-01

Dear Mr. Edington:

A routine inspection of storage and loading operations at the Palo Verde Nuclear Generating Station (PVNGS) Independent Spent Fuel Storage Installation (ISFSI) was conducted on February 23-25, 2010. At the conclusion of the inspection on February 25, 2010, an exit briefing was conducted with Mr. Robert Bement, Vice President of Nuclear Operations, and other members of your staff. The enclosed report presents the scope and results of that inspection.

The inspection was an examination of activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. Within these areas, the inspection included reviews of loading operations; a tour of the ISFSI; fuel inventory and selection; ISFSI operation; quality assurance; radiological controls; records and safety reviews conducted by your staff.

The NRC has determined that a potential violation of 10 CFR Part 72, Subpart K, was identified involving changes you made to conditions of your general license to store spent fuel issued pursuant to 10CFR72.210. These changes involved your action to apply conditions contained in Certificate of Compliance (CoC) amendments to previously loaded casks which were loaded under a prior CoC amendment. Specifically, it was determined that Arizona Public Service Company applied all of the changes described by the CoC amendments listed in 10 CFR 72.214 to previously loaded casks prior to issuance of the proposed rule entitled "License and Certificate of Compliance Terms," RIN 3150-AI09, and without obtaining NRC approval through an exemption request pursuant to 10 CFR 72.7. The NRC has issued enforcement guidance EGM-09-006 that permits enforcement discretion to be applied to this potential violation provided that the licensee has met certain conditions. Because Arizona Public Service Company performed an evaluation pursuant to 10 CFR Part 72.212 for its application of all the changes of the current cask certificate amendment to the previously loaded casks within the 4 month time limit imposed by EGM-09-006 after the issuance of the proposed rule RIN 3150-AI09, the NRC is exercising enforcement discretion in accordance with Section VII.B.6 of the NRC Enforcement Policy and, therefore, is not issuing any enforcement action for this potential violation.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room). To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact the undersigned at (817) 860-8191 or Mr. Ray Kellar at (817) 860-8121.

Sincerely,
/RA/

D. Blair Spitzberg, PhD, Chief
Repository & Spent Fuel Safety Branch

Docket: 050-00528; 050-00529; 050-00530; 072-00044

License: NPF-41; NPF-51; NPF-74

Enclosure: NRC Inspection Report 50-528/10-09; 50-529/10-09; 50-530/10-09; 72-44/07-01

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Publicly Avail.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sensitive Value:		
RIV:DNMS:RSFS	RSFS	ACES/OE	C:RSFS	
LBrookhart	RLKellar	RLKellar	DBSpitzberg	
/RA/	/RA/	/RA/	/RA/	
03/25/10	03/25/10	03/25/10	03/26/10	

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 050-00528; 050-00529; 050-00530; 072-00044

License: NPF-41; NPF-51; NPF-74

Report: 50-528/10-09; 50-529/10-09; 50-530/10-09; 72-44/07-01

Licensee: Arizona Public Service Company

Location: Palo Verde Independent Spent Fuel Storage Installation
5951 S. Wintersburg
Tonopah, Arizona

Dates: February 23-25, 2010

Inspectors: Ray L. Kellar, PE, Health Physicist
Repository & Spent Fuel Safety Branch

Accompanied By: Lee Brookhart, Health Physicist
Repository & Spent Fuel Safety Branch

Approved By: D. Blair Spitzberg, Chief
Repository & Spent Fuel Safety Branch

Attachment: 1) Supplemental Inspection Information
2) Loaded Casks at the Palo Verde ISFSI

ENCLOSURE

EXECUTIVE SUMMARY

Palo Verde Nuclear Generating Station
NRC Inspection Report 50-528/10-09; 50-529/10-09; 50-530/10-09; 72-44/07-01

The Independent Spent Fuel Storage Installation (ISFSI) at Palo Verde Nuclear Generating Station (PVNGS) contained 70 loaded NAC-UMS Ventilated Concrete Casks (VCCs) at the time of the inspection, February 23 - 25, 2010. During the inspection the inspectors observed licensee personnel performing loading activities associated with VCC 71. Personnel assigned to activities associated with the ISFSI were knowledgeable of their responsibilities and were performing operations in accordance with the licensee's approved procedures.

Operations of an ISFSI at Operating Plants (60855.1)

- Spent nuclear fuel continues to be moved to the ISFSI pad since the first loaded cask in March of 2003. To date, 70 casks have been loaded and placed on the ISFSI pad. A tour of the pad area found the facility and casks in good physical condition (Section 1.2.a).
- Environmental radiation levels around the ISFSI were being adequately monitored to confirm compliance with 10CFR72.104 limits for doses to individuals. Surface dose rates and contamination levels for two recently loaded casks were selectively reviewed and found to be in compliance with limits specified in Technical Specifications (TS) 3.2.1 and 3.2.2 (Section 1.2.b).
- Temperature monitoring of each of the storage casks demonstrated that temperature levels have remained within required performance limits established in Technical Specification 3.1.6.1 (Section 1.2.c).
- A portion of the welding and non-destructive testing of the canister shield lid was observed for cask number 71 and was verified to have been performed in accordance with plant procedures (Section 1.2.d).
- The licensee had implemented a fuel assembly selection procedure consistent with the NAC CoC requirements for the type of fuel being loaded at the Palo Verde nuclear plant (Section 1.2.e).
- The annual ISFSI concrete cask inspections had been completed with no abnormal cask deterioration observed (Section 1.2.f).
- The annual nondestructive examinations of the transfer cask trunnions, shield door, shield door rails and lift yoke had been performed in accordance with the requirements specified in the Final Safety Analysis Report (FSAR) (Section 1.2.g).
- Selected quality assurance audits, condition reports and records were reviewed with no issues or concerns identified by the inspectors. An issue concerning submittal of revisions of the emergency plan to the Director of the Spent Fuel Project Office was identified by the licensee and corrected (Section 1.2.h, 1.2.i, 1.2.j).

- The Licensee has performed a 10 CFR 72.212 evaluation for its application of all of the changes described by NAC-UMS Certificate Number 1015 Amendment 5 to the previously loaded casks by January 15, 2010, which is 4 months after the issuance of the proposed rule RIN 3150-AI09. The NRC is exercising enforcement discretion in accordance with Section VII.B.6 of the NRC Enforcement Policy and, therefore, is not issuing any enforcement action for this potential violation. (Section 1.2.k).

Review of 10 CFR 72.48 Evaluations (60857)

- All safety screenings and evaluations had been performed in accordance with plant procedures. No findings of significance were identified (Section 2).

Review of Inspection Follow-up Item (92701)

- During the last inspection, the licensee had conservatively revised the start of the canister vacuum drying time clock to begin when the canister drain down operations commenced rather than when the drain down had been completed. Documentation reviewed for the first 22 casks loaded found adequate assurance that the canisters were within the bounds of the NAC thermal analysis. (Section 3).

Report Details

Summary of Facility Status-ISFSI

The Palo Verde Nuclear Generation Station ISFSI contained 70 loaded NAC-UMS Ventilated Concrete Casks (VCCs) at the time of the inspection. The 71st cask was in the process of being loaded during the February 23 - 25, 2010 inspection period.

1 Operations of an ISFSI at Operating Plants (60855.1)

1.1 Inspection Scope

The Palo Verde operational ISFSI inspection reviewed selected records and conducted interviews with site personnel to verify ISFSI operations were in compliance with the Palo Verde License # 72-44, NAC-UMS # 72-1015 CoC Amendment 5 and the Final Safety Analysis Report, Revision 8A. A tour of the ISFSI was conducted to confirm the facility was being maintained in good physical condition for the safe storage of the spent fuel.

1.2 Observations and Findings

a. Site Tour of the ISFSI

A tour was conducted of the ISFSI area to assess the condition of the ISFSI. The storage casks were observed to be in good condition. No flammable or combustible materials were observed inside the ISFSI cask storage area. Environmental dosimetry was located on each of the four sides of the ISFSI protected area fence. Erosion had occurred on the shielding berms and around the outer perimeter of the ISFSI. The erosion had deposited a small amount of sediment on the ISFSI pad. The operability of the ISFSI was not affected by the erosion and the licensee had initiated Condition Report #3430594 to address the issue.

b. Radiological

Radiological dose rates around the ISFSI were documented in Condition Report #3303290. The dose rates had been taken on each of the four sides of the ISFSI protected area fence and within the owner controlled area. The highest reading was 16.4 $\mu\text{R/hr}$ (33 mR/year based on a 2,000 hour work year) in the southeast corner of the ISFSI. Based on the ISFSI fence area being well away from any normally occupied areas, the dose to a real individual was well below the 25 mrem/yr limit of 10CFR72.104.

Contamination surveys for two previously loaded casks, numbers 66 and 68, were reviewed to ensure compliance with TS 3.2.1, which required that removable contamination on the accessible exterior surfaces of the canister or accessible interior surfaces of the transfer cask shall not exceed 10,000 dpm/100 cm² from beta and gamma sources; and 100 dpm/100 cm² from alpha sources prior to transport operations. Palo Verde Procedure 75DC-9SF01, "*Radiation Protection Requirements for Dry Cask Storage*," Revision 4, properly specified the required contamination surveys. Survey # 3-09-03520 verified for cask 66 that all surveys were below the TS 3.2.1 limits. Survey # 2-M-20100129-3 verified for cask 68 that all surveys were below TS 3.2.1

limits. All surveys for both casks were < 1,000 dpm/100cm² from beta/gamma sources and < 20 dpm/100cm² from alpha sources.

Cask radiation dose surveys for casks numbers 66 and 68 were reviewed to ensure compliance with TS 3.2.2, which required that the average surface dose rate of each concrete cask shall not exceed the following limits: 50 mrem/hr (neutron + gamma) on the side, 50 mrem/hr (neutron + gamma) on the top, and 100 mrem/hr (neutron + gamma) at the air inlets and outlets. Palo Verde Procedure 75DC-9SF01, "*Radiation Protection Requirements for Dry Cask Storage*," Revision 4 properly specified the required radiation surveys. Survey # 3-09-03525 verified for cask 66 that all surveys were below the TS 3.2.2 limits. For cask 66, the average side was 1.3 mrem/hr, the average top was 3.33 mrem/hr, and the average air vent was 5.93 mrem/hr. Survey # 2-M-20100129-5 verified for cask 68 that all surveys were below TS 3.2.2 limits. For cask 68, the average side was 1.17 mrem/hr, the average top was 2.3 mrem/hr, and the average air vent was 7.15 mrem/hr.

c. Temperature Monitoring

Technical Specification 3.1.6.1 required temperature monitoring of the casks to verify that the difference between the ISFSI ambient temperature and the average outlet air temperature was ≤ 102 °F to validate heat rejection performance of the casks and ensure fuel integrity. Each cask had a temperature monitor located at its outlet air vent. Procedure 78ST-1ZD01, "*Daily ISFSI Temperature Monitoring Surveillance*," Revision 3, and Procedure 40ST-9ZZM1, "*Operations Mode 1 Surveillance Logs*," Revision 46, had incorporated the TS 3.1.6.1 temperature monitoring requirements. The temperature monitoring documentation for August 2005 and June 2008, were reviewed to verify compliance. The cask temperature data showed the highest temperature difference between ambient and air outlet temperature was around 73 °F in late August of 2005. The heat rejection performance of the casks were all well within the TS 3.1.6.1 limit.

d. Loading Operations

During the inspection, the licensee was performing operations to complete the loading of the 71st VCC for storage at their ISFSI. The inspectors witnessed a portion of the welding and NDE of the transportable storage canister shield lid. The licensee had contracted PCI Energy Services to perform this task. The contractor was utilizing Palo Verde approved Procedure PI-CNSTR-T-OP210, "*Closure Welding of Dry Cask Storage Canisters*," Revision 1 to perform these activities. The activities were being safely performed per the approved procedure.

e. Fuel Selection

The NAC CoC, Section B 2.0 "*Approved Contents*" defined the fuel assembly characteristics that were approved for loading into the NAC-UMS canister. The characteristics applicable to the fuel at Palo Verde were in Tables B 2-1 through B 2-5, including decay heat per assembly, total cask heat, enrichment percent, burn-up, cooling time, and fuel dimensions. The licensee had incorporated the fuel characteristics for the CE 16 x 16 fuel assemblies into Procedure 72DP-9NF02 "*Fuel Assembly Selection for Dry Cask Storage*," Revision 8. Data for two recently loaded casks, numbers 66 and 68, were reviewed to determine if the fuel selected for the casks met the requirements of the licensee's procedure. Both casks 66 and 68 were properly loaded with fuel assemblies

that met the requirements of the licensee's procedure and CoC Section B 2.0 requirements.

f. Annual Concrete VCC Inspections

FSAR 1015, Section 9.2.1 required an annual inspection of the concrete casks that included a visual examination of the concrete surfaces for chipping, spalling, or other surface defects. Defects larger than 1" in diameter and deeper than 1" shall be grouted and concrete-inhibiting (external) coatings applied on accessible corroded surfaces, including concrete cask lifting lugs, if present. The documentation for the inspections performed in 2005 and 2006 was reviewed by the inspectors. The licensee completed these inspections using Procedure 81DP-0ZZ01, "*Civil System, Structure, and Component Monitoring Program*," Revision 11. The results were documented in Component Observation Reports (COR) # 05-9-001 for the 2005 inspection and COR # 06-9-001 for the 2006 inspection. There was no abnormal cask deterioration identified. There were a few minor issues discovered, such as loose vent anchor bolts, rusted carbon steel washers, and surface rust on lift lugs. All issues were repaired through the use of Condition Reports.

g. Transfer Casks Annual Inspection

FSAR 1015 Section 9.2.2 required annual visual inspections of the lifting trunnions, shield door, shield door rails and lift yoke in accordance with ANSI N14.6 and a dimensional inspection of load-bearing components with a nondestructive examination of major load-bearing welds. The licensee had complied with this requirement through Work Order (WO) #3118355 and WO #3242189 on September 15, 2009. The visual inspection of the welds included the lifting trunnions to inner and outer shells, shield door rails to bottom plate, bottom plate to inner and outer shells, transfer cask shield doors and inner and outer girth welds. The NDE results were documented on Magnetic Particle Examination Report 09-506. No indications or cracks were identified on the welds.

h. Quality Assurance (QA) Audits/Surveillances

Regulation 10 CFR 72.176 required licensees to conduct periodic audits to verify compliance with all aspects of the QA program and to determine the effectiveness of the program. The licensee had conducted ISFSI Audit Report # 2008-015 for the year 2008 to comply with this regulation. The audit scope included: ISFSI program and licensing, ISFSI design control, operation, maintenance, document control, QA, training, corrective action program, and industry experience. No findings of significance were identified. The next ISFSI audit is scheduled by the licensee for mid 2010.

i. Condition Reports

The licensee provided a list of approximately 200 condition reports regarding ISFSI operations that had been initiated in the corrective action system since the last inspection. Sixteen reports were selected for further review. Through discussions with the licensing engineer, senior nuclear fuels engineer, and reviews of the condition reports, all issues were found to have been adequately resolved. No adversely developing trends were identified in the condition reports.

j. Records

The licensee complied with 10 CFR 72.44(d) and submitted annual radiological effluent release reports for the years 2003 through 2009. The reports stated that no radionuclides were released to the environment from liquid or gaseous effluents during the calendar years from the ISFSI.

The licensee complied with 10 CFR 72.48(d)(2) and submitted reports for 72.48 evaluations performed in compliance with intervals not to exceed 24 months. The reports reviewed included years 2003 through 2008.

Regulation 10 CFR 72.44(f) required the licensee to submit, within six months of an emergency plan change, a report containing a description of any changes to the Director of the Spent Fuel Project Office. The licensee had identified that emergency plan changes, Revisions 29 through 33, had not been submitted to the Director of Spent Fuel Project Office, as required. The licensee had submitted the changes to the emergency plan, as required by 10 CFR 50.54 (q), to the US NRC Document Control Desk. The licensee corrected this issue in the submittal of Revision 34 of their emergency plan, dated February 1, 2006. The document acknowledged the discrepancy per 10 CFR 72.44(f) regarding the required submittals to Revisions 29 through 33 for their emergency plan. Revisions 29 through 33 were reviewed by the inspectors and determined not to have a direct impact on the ISFSI. Due to the fact the issue had been corrected, there were no changes in emergency plan revisions 29 through 33 that impacted the ISFSI, and that it was properly submitted to the NRC per 10 CFR 50.54(q), this issue was determined to constitute a violation of minor significance that is not subject to enforcement in accordance with Section IV of the Enforcement Policy.

k. Enforcement Guidance Memorandum EGM-09-006 – Enforcement Discretion for Violations of 10 CFR Part 72, Implementation of Certificate of Compliance Amendments to Previously Loaded Spent Fuel Casks

Current NRC regulations require that for 10 CFR Part 72 general licensees, any cask loaded with spent fuel must comply with the terms, conditions, and specifications (TSCs) of the certificate of compliance (CoC) under which that cask was loaded. The NRC staff has determined that a change described by a latter CoC amendment cannot be applied to a cask loaded under the original CoC or an earlier amendment without prior NRC approval, if such a change results in a change to the TSCs of the CoC under which the cask was loaded. Therefore, under current regulations, general licensees that want to apply any changes from a latter CoC amendment to a previously loaded cask must request an exemption from the NRC, pursuant to 10 CFR 72.7.

On September 15, 2009, the NRC issued a proposed rule for public comment entitled "License and Certificate of Compliance Terms," RIN 3150-AI09. The proposed rule will allow general licensees to implement, without prior NRC approval, changes described by a CoC amendment listed in 10 CFR 72.214 to a previously loaded cask, provided that the cask, after the changes have been applied, conforms to the all TSCs of the CoC amendment. Partial or selective application of some of the authorized changes, but not others, would continue to require prior NRC approval through an exemption request. Additionally, the NRC issued Enforcement Guidance Memo EGM-09-006 to address the

general licensees who have implemented changes described by a CoC amendment to a previously loaded cask without prior NRC approval, prior to issuance of the proposed rule.

The licensee records indicated that canister loading operations had been completed in accordance with each NAC-UMS Amendment. However, the licensee had elected to the revise their 72.212 evaluation for each new NAC-UMS Amendment to implement the most current cask monitoring requirements for all the casks that had been placed on the ISFSI pad, to keep all the cask monitoring requirements consistent. At the time of the inspection, the licensee was found to be implementing the cask monitoring requirements for casks that had been loaded under NAC-UMS Amendments 2, 3, 4 and 5 per the requirements of NAC-UMS Amendment 5.

The inspectors reviewed a NAC evaluation that had been performed of all the NAC-UMS CoC/Technical Specifications changes that had been made from Amendment 2 through 5, as well as all changes from NAC-UMS FSAR revision 2 through 8A by by NAC document number 12407-2003 Revision 0. The licensee had performed an evaluation per Engineering Work Order #3426336, of eight site specific changes that were not addressed by the NAC evaluation. The licensee determined that the conditions of CoC amendment 5 could be applied to the previously loaded casks. The licensee performed a Licensing Document Change Request (LDCR) # 10-D001, to support the change to the 72.212 report, revision 9, that implemented all the NAC-UMS CoC Amendment 5 changes to previously loaded casks. The 72.212 evaluation was completed and implemented within the 4 month time limit imposed by EGM-09-006. No significant findings were observed by the inspectors during the documentation review.

The NRC has determined that a potential violation of 10 CFR Part 72, Subpart K, was identified regarding Arizona Public Service Company, which holds a general license pursuant to 10 CFR 72.210. The Licensee has applied all of the changes described by a CoC amendments listed in 10 CFR 72.214 to a previously loaded casks prior to issuance of the proposed rule entitled "License and Certificate of Compliance Terms," RIN 3150-AI09, and without obtaining NRC approval.

Because the Licensee has performed a 10 CFR 72.212 evaluation for its application of all of the changes described by NAC-UMS Certificate Number 1015 Amendment 5 to the previously loaded casks by January 15, 2010, which is 4 months after the issuance of the proposed rule RIN 3150-AI09, the NRC is exercising enforcement discretion in accordance with Section VII.B.6 of the NRC Enforcement Policy and, therefore, is not issuing any enforcement action for this potential violation.

The following table provides information required by EGM-06-009, on the NAC-UMS CoC 1015 cask number, date loaded and which amendment that the cask was loaded under:

Cask ID No.	Loaded Under	Date Loaded	Cask ID No.	Loaded Under	Date Loaded
AMZDFX001	Amendment 2	03/15/2003	AMZDFX036	Amendment 4	01/27/2006
AMZDFX002	Amendment 2	04/15/2003	AMZDFX037	Amendment 4	02/09/2006
AMZDFX003	Amendment 2	05/15/2003	AMZDFX038	Amendment 4	02/17/2006
AMZDFX004	Amendment 2	05/29/2003	AMZDFX039	Amendment 4	02/24/2006
AMZDFX005	Amendment 2	06/12/2003	AMZDFX040	Amendment 4	03/03/2006

AMZDFX006	Amendment 2	07/24/2003	AMZDFX041	Amendment 4	03/10/2006
AMZDFX007	Amendment 2	08/07/2003	AMZDFX042	Amendment 4	07/21/2006
AMZDFX008	Amendment 2	08/21/2003	AMZDFX043	Amendment 4	07/29/2006
AMZDFX009	Amendment 2	09/05/2003	AMZDFX044	Amendment 4	08/04/2006
AMZDFX010	Amendment 2	09/18/2003	AMZDFX045	Amendment 4	08/18/2006
AMZDFX011	Amendment 2	01/23/2004	AMZDFX046	Amendment 4	08/25/2006
AMZDFX012	Amendment 2	02/06/2004	AMZDFX047	Amendment 4	09/01/2006
AMZDFX013	Amendment 2	02/26/2004	AMZDFX048	Amendment 4	04/06/2007
AMZDFX014	Amendment 2	03/11/2004	AMZDFX049	Amendment 4	04/13/2007
AMZDFX015	Amendment 2	03/25/2004	AMZDFX050	Amendment 4	04/20/2007
AMZDFX016	Amendment 2	05/27/2004	AMZDFX051	Amendment 4	04/28/2007
AMZDFX017	Amendment 3	07/15/2004	AMZDFX052	Amendment 4	05/04/2007
AMZDFX018	Amendment 3	07/29/2004	AMZDFX053	Amendment 4	05/11/2007
AMZDFX019	Amendment 3	08/12/2004	AMZDFX054	Amendment 4	09/25/2008
AMZDFX020	Amendment 3	08/26/2004	AMZDFX055	Amendment 4	12/06/2008
AMZDFX021	Amendment 3	09/10/2004	AMZDFX056	Amendment 4	12/16/2008
AMZDFX022	Amendment 3	09/23/2004	AMZDFX057	Amendment 4	12/31/2008
AMZDFX023	Amendment 3	01/22/2005	AMZDFX058	Amendment 4	02/28/2009
AMZDFX024	Amendment 3	02/17/2005	AMZDFX059	Amendment 5	03/10/2009
AMZDFX025	Amendment 3	02/24/2005	AMZDFX060	Amendment 5	03/20/2009
AMZDFX026	Amendment 3	03/03/2005	AMZDFX061	Amendment 5	06/09/2009
AMZDFX027	Amendment 3	03/10/2005	AMZDFX062	Amendment 5	06/24/2009
AMZDFX028	Amendment 3	03/30/2005	AMZDFX063	Amendment 5	08/08/2009
AMZDFX029	Amendment 3	08/03/2005	AMZDFX064	Amendment 5	08/21/2009
AMZDFX030	Amendment 3	08/11/2005	AMZDFX065	Amendment 5	08/28/2009
AMZDFX031	Amendment 3	08/19/2005	AMZDFX066	Amendment 5	09/04/2009
AMZDFX032	Amendment 3	08/31/2005	AMZDFX067	Amendment 5	09/11/2009
AMZDFX033	Amendment 3	09/08/2005	AMZDFX068	Amendment 5	01/29/2010
AMZDFX034	Amendment 3	09/20/2005	AMZDFX069	Amendment 5	02/05/2010
AMZDFX035	Amendment 4	01/20/2006	AMZDFX070	Amendment 5	02/12/2010

1.3 Conclusions

Spent nuclear fuel continues to be moved to the ISFSI pad since the first loaded cask in March of 2003. To date, 70 casks have been loaded and placed on the ISFSI pad. A tour of the pad area found the facility and casks in good physical condition (Section 1.2.a).

Environmental radiation levels around the ISFSI were being adequately monitored to confirm compliance with 10CFR72.104 limits for doses to individuals. Surface dose rates and contamination levels for two recently loaded casks were selectively reviewed and found to be in compliance with limits specified in TS 3.2.1 and 3.2.2 (Section 1.2.b).

Temperature monitoring of each of the storage casks demonstrated that temperature levels have remained within required performance limits established in Technical Specification 3.1.6.1 (Section 1.2.c).

A portion of the welding and non-destructive testing of the canister shield lid was observed for cask number 71 and was verified to have been performed in accordance with plant procedures (Section 1.2.d).

The licensee had implemented a fuel assembly selection procedure consistent with the NAC CoC requirements for the type of fuel being loaded at the Palo Verde nuclear plant (Section 1.2.e).

The annual ISFSI concrete cask inspections had been completed with no abnormal cask deterioration observed (Section 1.2.f).

The annual nondestructive examinations of the transfer cask trunnions, shield door, shield door rails and lift yoke had been performed in accordance with the requirements specified in the FSAR (Section 1.2.g).

Selected quality assurance audits, condition reports and records were reviewed with no issues or concerns identified by the inspectors. An issue concerning submittal of revisions of the emergency plan to the Director of the Spent Fuel Project Office was identified by the licensee and corrected (Section 1.2.h, 1.2.i, 1.2.j).

The Licensee has performed a 10 CFR 72.212 evaluation for its application of all of the changes described by NAC-UMS Certificate Number 1015 Amendment 5 to the previously loaded casks by January 15, 2010, which is 4 months after the issuance of the proposed rule RIN 3150-AI09. The NRC is exercising enforcement discretion in accordance with Section VII.B.6 of the NRC Enforcement Policy and, therefore, is not issuing any enforcement action for this potential violation. (Section 1.2.k).

2 Review of 10 CFR 72.48 Evaluations (60857)

2.1 Inspection Scope

Changes to the facility and procedures since the last inspection in March of 2005 were reviewed to determine if the licensee had performed the required evaluations in accordance with the requirements of 10 CFR 72.48.

2.2 Observations and Findings

There were fourteen safety screenings and one 72.48 evaluation performed by the licensee since the last inspection in March 2005. The safety screenings had been performed in accordance with Procedure 93DP-0LC03, "*Licensing Document Maintenance*," Revision 18. Three screening, S-05-001, S-05-003, S-07-006 and the one evaluation E-05-001 were reviewed by the inspectors. No findings of significant were identified.

2.3 Conclusions

All safety screenings and evaluations had been performed in accordance with plant procedures. No findings of significance were identified.

3 Inspector Follow-up Item (92701)

3.1 Inspection Scope

During the last inspection, the licensee had conservatively altered the start of the canister vacuum drying time clock to begin when the canister drain down operations

commenced rather than when the drain down had been completed. This change had been implemented by the licensee after an event occurred where another utility utilizing a similar NAC system, allowed multiple blowdowns of the canister during the drain down time clock that was contrary to the NAC thermal analysis. Condition Report Action Item (CRAI) 2764883 had been initiated by the licensee to ensure that the previously loaded 22 casks were not outside the bases of the NAC thermal analysis.

3.2 Observations and Findings

The inspectors reviewed the licensee documentation contained in CRAI 2764883 and in Condition Report/Disposition Request (CRDR) 2751244. The CRAI evaluated the TS required vacuum drying time clock performance times associated with the loading conditions that had occurred during the first 22 casks. The method used by the licensee to evaluate the canister vacuum drying time was to add two hours to allowed TS action time for draining the water from the canister and compare this to the times recorded during the loading operation for each canister from the beginning of the water draining process to the end of the vacuum drying process. Two canisters (# 3 and # 5) indicated that the time calculated in this manner could slightly exceed the calculated vacuum drying time by a total time of less than two hours. The time recorded by the licensee while performing the TS vacuum drying times for canisters # 3 and # 5 were 29 hrs, 51 minutes and 30 hrs, respectively. Both of these vacuum drying times were within the allowed TS vacuum drying time clock. It was noted that in CoC Amendment 3, the allowable time limits associated with vacuum drying equivalent heat loads increased by 12 hours, which would bound the vacuum drying times associated with canisters # 3 and # 5. As the two canisters in question met the specified TS vacuum drying time limits and were bounded by the allowable time limits that were included in CoC 1015, Amendment 3 TS time limits, the previously loaded 22 canisters were determined to meet the thermal loading requirements. NAC had also evaluated the loading conditions for the first 22 NAC UMS canisters at Palo Verde and determined that there had been no adverse effects on either the stored fuel or the storage system.

3.3 Conclusions

(Closed) IFI 072-0044/0501-01 Review of previously loaded 22 casks for compliance with the NAC thermal analyses bases. During the last inspection, the licensee had conservatively revised the start of the canister vacuum drying time clock to begin when the canister drain down operations commenced rather than when the drain down had been completed. Documentation reviewed for the first 22 casks loaded found adequate assurance that the canisters were within the bounds of the NAC thermal analysis.

4 **Exit Meeting**

The inspectors reviewed the scope and findings of the inspection during an exit meeting that was conducted at the conclusion of the onsite inspection on February 25, 2010. The licensee did not identify any information as proprietary that was provided to, or reviewed, by the inspectors.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

R. Bement, Vice President of Nuclear Operations
K. Chavet, Regulatory Affairs
C. Stephenson, Licensing Engineer
D. Mims, Regulatory Affairs
T. Weber, Regulatory Affairs
W. Wong, Senior Nuclear Fuel Engineer

INSPECTION PROCEDURES USED

IP 60855.1 Operation of an ISFSI at Operating Plants
IP 60857 Review of 10 CFR 72.48 Evaluations
IP 92701 Follow-up

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

072-0044/0501-01 IFI Review of previously loaded 22 casks for compliance with the
NAC thermal analyses bases

Discussed

None

LIST OF ACRONYMS

ANSI	American National Standards Institute
CoC	Certificate of Compliance
COR	Component Observation Report
CRAI	Condition Report Action Item
CFR	Code of Federal Regulations
CRDR	Condition Report / Disposition Request
DPM	Disintegrations Per Minute
EA	Enforcement Action
EGM	Enforcement Guidance Memorandum
FSAR	Final Safety Analysis Report
IFI	Inspection Follow-up Item
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation

NDE	Non Destructive Examination
NRC	Nuclear Regulatory Commission
mrem/hr	milliRem per hour
PVNGS	Palo Verde Nuclear Generating Station
TSC	Terms, Conditions, and Specifications
TS	Technical Specification
TLD	Thermo-Luminescent Dosimeter
UMS	Universal Multipurpose System
μR/hr	microRoentgens per hour
VCC	Ventilated Concrete Cask or cask
WO	Work Order

LOADED NAC-UMS CASKS AT THE PALO VERDE ISFSI

LOADING ORDER	VCC CASK #	UNIT	DATE PLACED ON PAD	HEAT LOAD (Kw)	MAXIMUM BURNUP MWd/MTU	MAXIMUM FUEL ENRICHMENT	MANHOURS TO LOAD	Person-Rem DOSE
1	#1	Unit 2	3/15/03	7.59	42,833	4.0334	5178	0.535
2	#2	Unit 2	4/15/03	7.76	41,841	4.0368	4635	0.389
3	#3	Unit 2	5/15/03	10.17	40,737	4.0397	2285	0.496
4	#4	Unit 2	5/29/03	10.04	40,408	4.0098	2208	0.338
5	#5	Unit 2	6/12/03	10.96	38,357	4.044	1244	0.274
6	#6	Unit 1	7/24/03	10.37	42,318	4.050	845	0.291
7	#7	Unit 1	8/07/03	10.48	42,214	4.046	715	0.267
8	#8	Unit 1	8/21/03	11.03	42,168	4.057	786	0.331
9	#9	Unit 1	9/05/03	11.52	42,050	4.057	738	0.261
10	#10	Unit 1	9/18/03	7.14	30,134	3.309	655	0.222
11	#11	Unit 3	1/23/04	12.16	39,735	3.905	1930	0.280
12	#12	Unit 3	2/06/04	12.13	39,574	3.917	1736	0.239
13	#13	Unit 3	2/26/04	12.26	39,821	3.913	1984	0.294
14	#14	Unit 3	3/11/04	11.52	39,640	3.919	1455	0.203
15	#15	Unit 3	3/25/04	11.73	39,180	3.917	1077	0.216
16	#16	Unit3	5/27/04	11.74	39,939	3.913	2003	0.265
17	#17	Unit 2	7/15/04	10.65	44,693	4.041	1515	0.195
18	#18	Unit 2	7/29/04	10.66	44,637	4.050	1270	0.164
19	#19	Unit 2	8/12/04	9.71	43,369	4.030	1202	0.137
20	#20	Unit 2	8/26/04	9.73	43,362	4.043	1032	0.095

21	#21	Unit 2	9/10/04	9.73	43,350	4.044	1221	0.125
22	#22	Unit 2	9/23/04	9.73	43,205	4.036	987	0.115
23	#23	Unit 1	1/22/2005	12.279	44,953	4.032	1806	0.165
24	#24	Unit 1	3/17/2005	12.279	44,973	4.035	1887	0.178
25	#25	Unit 1	3/24/2005	12.046	44,973	4.033	1265	0.193
26	#26	Unit 1	3/3/2005	12.401	44,992	4.033	728	0.097
27	#27	Unit 1	3/10/2005	12.402	44,608	4.032	872	0.126
28	#28	Unit 1	3/30/2005	12.058	44,957	4.033	908	0.115
29	#29	Unit 3	8/3/2005	10.328	41,361	3.528	1536	0.144
30	#30	Unit 3	8/11/2005	10.240	41,603	3.528	1054	0.142
31	#31	Unit 3	8/19/2005	11.604	44,247	3.970	1089	0.116
32	#32	Unit 3	8/31/2005	11.556	43,594	4.000	1101	0.105
33	#33	Unit 3	9/8/2005	11.569	44,247	3.992	920	0.104
34	#34	Unit 3	9/20/2005	11.565	43,594	4.001	721	0.094
35	#34	Unit 2	1/20/2006	11.980	44,849	4.384	1000	0.100
36	#36	Unit 2	1/27/2005	12.000	44,877	4.386	888	0.091
37	#37	Unit 2	2/9/2006	11.976	44,877	4.388	985	0.064
38	#38	Unit 2	2/17/2006	11.983	44,877	4.386	761	0.066
39	#39	Unit 2	2/24/2006	11.990	44,877	4.390	741	0.078
40	#40	Unit 2	3/3/2006	12.010	44,390	4.383	945	0.051
41	#41	Unit 2	3/10/2006	12.022	43,877	4.380	721	0.064
42	#42	Unit 1	7/21/2006	8.515	44,801	4.162	939	0.035

43	#43	Unit 1	7/29/2006	8.394	44,801	4.149	870	0.042
44	#44	Unit 1	8/4/2006	8.411	44,801	4.148	740	0.035
45	#45	Unit 1	8/18/2006	8.412	44,801	4.144	975	0.041
46	#46	Unit1	8/25/2006	8.458	44,706	4.146	804	0.044
47	#47	Unit 1	9/1/2006	8.447	44,706	4.146	652	0.032
48	#48	Unit 3	4/6/2007	9.071	44,841	4.287	802	0.058
49	#49	Unit 3	4/13/2007	8.805	44,778	4.287	848	0.058
50	#50	Unit 3	4/20/2007	8.764	44,778	4.266	789	0.049
51	#51	Unit 3	4/28/2007	8.796	44,778	4.272	841	0.049
52	#52	Unit 3	5/4/2007	8.669	44,841	4.269	956	0.046
53	#53	Unit 3	5/11/2007	8.641	44,841	4.298	662	0.043
54	#54	Unit 2	9/25/2008	9.461	44,822	4.208	1062	0.107
55	#55	Unit 2	12/8/2008	9.538	44,822	4.208	1147	0.107
56	#56	Unit 2	12/16/2008	9.528	44,822	4.206	1270	0.051
57	#57	Unit 2	12/31/2008	9.564	44,822	4.387	1068	0.040
58	#58	Unit 1	2/28/2009	12.698	44,850	4.375	1126	0.096
59	#59	Unit 1	3/10/2009	14.171	53,665	4.378	1071	0.124
60	#60	Unit 1	3/20/2009	14.182	52,637	4.379	944	0.089
61	#61	Unit 1	6/9/2009	14.208	52,874	4.381	1130	0.121
62	#62	Unit 1	6/24/2009	14.233	52,915	4.379	1020	0.096
63	#63	Unit 3	8/8/2009	13.611	51,122	4.288	1029	0.108
64	#64	Unit 3	8/21/2009	13.611	51,122	4.289	898	0.094

65	#65	Unit 3	8/28/2009	13.837	49,692	4.381	902	0.096
66	#66	Unit 3	9/4/2009	13.861	49,692	4.384	824	0.106
67	#67	Unit 3	9/11/2009	13.880	49,692	4.387	764	0.104
68	#68	Unit 2	1/29/2010	12.728	49,797	4.387	989	0.099
69	#69	Unit 2	2/5/2010	12.729	49,797	4.384	1006	0.097
70	#70	Unit 2	2/12/2010	12.728	49,797	4.390	864	0.096

Unit 1: 22 casks loaded, average heat load = 11.10 kW; average man-hours to load = 976 hrs; average dose = 0.136 person-rem
Unit 2: 25 casks loaded, average heat load = 10.67 kW; average man-hours to load = 1448 hrs; average dose = 0.159 person-rem
Unit 3: 23 casks loaded, average heat load = 11.26 kW; average man-hours to load = 1126 hrs; average dose = 0.132 person-rem

Notes:

- PVNGS had loaded 70 casks at the time of the inspection
 - Heat Load (kW) is the sum of the heat load values of all 24 spent fuel assemblies
 - Burn-up is the value for the spent fuel assembly with the highest individual discharge burn-up
 - Fuel Enrichment is the spent fuel assembly with the highest individual enrichment percent of U-235