WILLIAM L. BERG
President and CEO

DAIRYLAND POWER
COOPERATIVE

January 16, 2014

In reply, please refer to LAC-14293

DOCKET NO. 50-409 and 72-046

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Dairyland Power Cooperative
La Crosse Boiling Water Reactor (LACBWR)
Possession-Only License DPR-45
Response to NRC Request for Additional Information Concerning License Amendment Request for Changes to LACBWR Emergency Plan

REFERENCES: 1) Letter, NRC to DPC dated December 16, 2013, Request for Additional Information Related to Dairyland Power Cooperative Request for Review and Approval of Major Changes to the La Crosse BWR Emergency Plan (TAC No. J52956)

Dairyland Power Cooperative (DPC) provides response and information in the enclosed material as requested in Reference 1.

If you have any questions concerning this information, please contact Don Egge, LACBWR Plant/ISFSI Manager at (608) 689-4207.

Sincerely,

William L Berg

William L. Berg, President and CEO

WLB:JBM:jkl

Enclosures: 1) Response to NRC Request for Additional Information Concerning License Amendment Request for Changes to LACBWR Emergency Plan
2) LACBWR Emergency Plan, Revision 31

AX45
FSME20
NMSS26
FSME
NMSS

cc w/Enclosures: John Hickman
Project Manager
U.S. Nuclear Regulatory Commission

Cynthia Pederson
Regional Administrator, Region III
U.S. Nuclear Regulatory Commission

STATE OF WISCONSIN)
)
COUNTY OF LA CROSSE)

Personally came before me this 16th day of January, 2014, the above named, William L. Berg, to me known to be the person who executed the foregoing instrument and acknowledged the same.

JANE M. EGGEN
Notary Public
State of Wisconsin

Jane M. Eggen
Notary Public, La Crosse County Wisconsin

My commission expires November 16, 2014

Response to NRC Request for Additional Information Concerning License Amendment Request for Changes to LACBWR Emergency Plan

Section 3.4 of SFST-ISG-16, provides in part,

> *Regulations for ISFSI installations located away from a reactor site require only one level of emergency classification, an Alert.*

NEI 99-01, Rev 6, provides in part,

> *In addition, appropriate aspects of IC HU1 and IC HA1 should also be included to address a HOSTILE ACTION directed against an ISFSI.*

10 CFR 72.32(a), provides,

> *Each application for an ISFSI that is licensed under this part which is: Not located on the site of a nuclear power reactor, or not located within the exclusion area as defined in 10 CFR part 100 of a nuclear power reactor, or located on the site of a nuclear power reactor which does not have an operating license, or located on the site of a nuclear power reactor that is not authorized to operate must be accompanied by an Emergency Plan that includes the following information:*
>
> *(3) Classification of accidents. – A classification system for classifying accidents as "alerts."*

RAI 1:

What is the technical basis for removal of the "Alert" classification in Revision 33 (Revision 32 also) as it was originally approved by the NRC on July 8, 1988 in Revision 10 of the Emergency Plan?

RAI 1A Response:

ISG-16 was used only as a model for content and formatting of the LACBWR Emergency Plan (E-Plan) as was done previously at Yankee-Rowe. The LACBWR ISFSI is located on the site of the LACBWR plant as described in NRC letter to Dairyland Power Cooperative (DPC) dated May 8, 2008 (ADAMS Accession No. ML081120634).

RAI 1B Response:

Appropriate aspects of Initiating Condition (IC) HU1 (Unusual Event – Confirmed Security Condition or Threat) are included in the LACBWR E-Plan.

IC HA1 (Alert – Hostile Action within Owner Controlled Area) will not be included in the LACBWR E-Plan because the LACBWR ISFSI has been exempted from "hostile action" requirements.

By letter dated July 31, 2013 (ADAMS Accession No. ML13008A565), the NRC approved exemptions to specific emergency planning requirements in 10 CFR 50.47 and Appendix E to Part 50 for the La Crosse Boiling Water Reactor Facility. Included in the Safety Evaluation Report (SER – ADAMS Accession No. 13008A597) for the approved exemptions is the following information that explains the basis for the exemption granted from "hostile action" requirements:

(4.3.1) 10 CFR Part 50, Appendix E, Section IV.1

1. The applicant's emergency plans shall contain, but not necessarily be limited to, information needed to demonstrate compliance with the elements set forth below, i.e., organization for coping with radiological emergencies, assessment actions, activation of emergency organization, notification procedures, emergency facilities and equipment, training, maintaining emergency preparedness, recovery~~, and onsite protective actions during hostile action~~. In addition, the emergency response plans submitted by an applicant for a nuclear power reactor operating license under this Part, or for an early site permit (as applicable) or combined license under 10 CFR Part 52, shall contain information needed to demonstrate compliance with the standards described in § 50.47(b), and they will be evaluated against those standards.

In the EP Final Rule, the Commission defined "hostile action" as, in part, an act directed toward a nuclear power plant or its personnel. The NRC excluded non-power reactors (NPR) from the definition of "hostile action" at that time because an NPR is not a nuclear power plant and a regulatory basis had not been developed to support the inclusion of non-power reactors in that definition. Further analysis and stakeholder interactions would be needed prior to including nonpower reactors in the definition of "hostile action."

Likewise, an ISFSI is not a nuclear power plant. The staff also considered the similarities between the LACBWR facility and a non-power reactor to determine whether the LACBWR facility should be included within the definition of "hostile action." NPRs pose lower radiological risks to the public from accidents than do power reactors because: (1) the core radionuclide inventories are lower as a result of their lower power levels and often shorter operating cycle lengths; and (2) NPRs have lower decay heat associated with a lower risk of core melt and fission product release in a loss-of-coolant accident. The LACBWR facility also has a low likelihood of a credible accident resulting in radiological releases requiring offsite protective measures. This fact formed part of the basis for DPC's 1988 exemptions from offsite EP requirements. For all of these reasons, the staff concludes that the LACBWR ISFSI is excluded from the definition of "hostile action."

Because the LACBWR ISFSI is not a facility that falls within the definition of "hostile action" in Appendix E of Part 50, the NRC staff concluded that DPC is exempt from the requirement in 10 CFR Part 50, Appendix E, Section IV.1 to have an emergency plan that contains "onsite protective actions during hostile action." The remaining requirements of Appendix E, Section IV.1 apply to DPC.

RAI 1C Response:

By regulation established in 10 CFR 72.13(c), DPC is not subject to the requirements of 10 CFR 72.32(a).

Dairyland Power Cooperative (DPC) is authorized by the NRC to store and possess spent nuclear fuel at LACBWR by Possession-Only License (DPR-45) pursuant to the provisions of 10 CFR 50. By virtue of the Part 50 license, DPC has been granted a general license for dry cask storage of spent nuclear fuel at the ISFSI under the provisions of 10 CFR 72 Subpart K.

The applicability of 10 CFR 72 regulations is defined in 10 CFR 72.13, "Applicability." 10 CFR 72.13(c) identifies Part 72 sections that apply to activities associated with a general license. 10 CFR 72.32(a) is not applicable to the LACBWR ISFSI, but 10 CFR 72.32(c) is applicable to the LACBWR ISFSI and states:

> (c) For an ISFSI that is:
>
> (1) located on the site, or
>
> (2) located within the exclusion area as defined in 10 CFR part 100, of a nuclear power reactor licensed for operation by the Commission, the emergency plan required by 10 CFR 50.47 shall be deemed to satisfy the requirements of this section.

ISFSI emergency response requirements were added to the plant E-Plan in Revision 31 dated May 2011 as permitted by 10 CFR 72.32(c)(2) above. Currently, DPC is requesting NRC approval for changes to the LACBWR E-Plan that remove emergency response requirements for the plant.

RAI 1D Response:

The technical basis for removal of the plant-related Alert classification is Sargent & Lundy Calculation No. 2013-03098, "Doses from Release of Site Non-ISFSI Radioactivity." As explained in the License Amendment Request for Proposed Revision of Emergency Plan, Description and Evaluation of Changes, with all spent fuel removed from the plant there is insufficient source term available at the plant such that there are no longer credible events at the plant that would result in doses to the public beyond the owner controlled area boundary that would exceed the EPA PAGs. The LACBWR D-Plan/PSDAR, Section 4.0 (included with the License Amendment Request) cites information from the analysis in the following:

> 4.4 SUMMARY OF ANALYSIS RESULTS
>
> 4.4.1 Postulated Airborne Release
>
> The results of the LACBWR post-fuel accident analysis involving a postulated airborne release are summarized in Table 4-1. As indicated in Table 4-1, the following four doses are calculated:
>
> 1. The dose to a person at the edge of the access road;

2. The dose to a person located in the G-3 parking lot;
3. The dose to a person working inside the G-3 office building; and
4. The dose to a person at the G-3 entry gate.

The analysis results summarized in Table 4-1 demonstrate that the consequences of releasing 30 percent of the non-ISFSI radioactive source term remaining at the LACBWR site to the atmosphere are well within the applicable 10 CFR 100.11 and EPA PAG limits

4.4.2 Postulated Liquid Release

The results of the LACBWR post-fuel accident analysis involving a postulated liquid release are summarized in Table 4-2. As indicated in Table 4-2, the following three postulated release scenarios were evaluated:

1. A (non-mechanistic) retention tank rupture with a direct release to Thief Slough;
2. A 20 gpm release rate directly to Thief Slough; and
3. A 20 gpm release rate into the minimum Genoa-3 Circulating Water flow, which empties into Thief Slough.

The analysis results are summarized in Table 4-2. These results demonstrate that the consequences of releasing 4800 gallons of water containing a radionuclide concentration of 3.90E-03 µCi/cc are less than the normal effluent concentration limit (1E-3 µCi/ml) of 10 CFR 20, Appendix B, Table 2, Column 2, for all three liquid release scenarios. It is noted that the release consequences for all three scenarios also are less than the 10 CFR 20.2003 annual release limits for disposal into sanitary sewerage systems. Although the 10 CFR 20.2003 limits are not directly applicable to these scenarios, the fact that the liquid release results are less than those limits further demonstrates the conclusion that the postulated releases would not have an adverse impact on the health and safety of the public or the environment.

The technical basis for the exclusion of an ISFSI-related Alert classification is NEI 99-01, Revision 6 which states that an Alert under 10 CFR 72.32 is consistent with a Notification of Unusual Event in a 10 CFR 50.47 emergency plan classification scheme. LACBWR is exempt from "hostile action" requirements as stated in RAI 1A. For this reason, NEI 99-01 Initiating Condition HA1, requiring an Alert classification, is not applicable to the LACBWR ISFSI.

NEI 99-01 states the following in Section 1.3, Independent Spent Fuel Storage Installation (ISFSI):

> Selected guidance in NEI 99-01 is applicable to licensees electing to use their 10 CFR 50 emergency plan to fulfill the requirements of 10 CFR 72.32 for a stand-alone ISFSI. The emergency classification levels applicable to an ISFSI are consistent with the requirements of 10 CFR 50 and the guidance in NUREG 0654/FEMA-REP-1. The initiating conditions germane to a 10 CFR 72.32 emergency plan (as described in NUREG-1567) are subsumed within the classification scheme for a 10 CFR 50.47 emergency plan.

and;

Regarding the above information, the expectations for an offsite response to an Alert classified under a 10 CFR § 72.32 emergency plan are generally consistent with those for a Notification of Unusual Event in a 10 CFR § 50.47 emergency plan (e.g., to provide assistance if requested). Also, the licensee's Emergency Response Organization (ERO) required for 10 CFR § 72.32 emergency plan is different than that prescribed for a 10 CFR § 50.47 emergency plan (e.g., no emergency technical support function).

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10 CFR 50.47 (b)(9), as exempted for the LACBWR facility, provides,

> *(9) Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.*

10 CFR 72.32(a), provides,

> *(4) Detection of accidents. Identification of the means of detecting an accident condition.*

RAI 2:

Is the SSS qualified to operate radiation monitoring equipment to determine the specific radiation levels to declare the Unusual Event? If so, is the equipment readily available? If not, what is the timeliness of the assessment and classification?

RAI 2 Response:

The ISFSI Security Shift Supervisor (SSS) is qualified to operate radiation monitoring equipment to determine radiation levels that would require declaration of Unusual Event. Dose rate monitoring equipment is readily available for use by the SSS in an emergency.

NEI 99-01, Rev 6, provides in part,

> *PD-AU1 Release of gaseous or liquid radioactivity greater than 2 times the (site-specific effluent release controlling document) limits for 60 minutes or longer.*

RAI 3:

Would this EAL be applicable to the LACBWR facility until such time as the facility is decommissioned?

RAI 3 Response:

PD-AU1 is not applicable to the LACBWR facility because no credible release of radioactivity via the airborne pathway or the liquid discharge pathway results in concentrations greater than 2 times the LACBWR ODCM effluent release limits for 60 minutes or longer.

Gaseous Radioactivity Release

There is no radioactive material in gaseous form (e.g., Kr and, Xe) remaining in the LACBWR Site Enclosure (LSE) that surrounds the plant buildings. The remaining radioactive material

inside the LSE is particulate material that is not readily dispersible. There is no motive force to create and maintain an airborne dispersion of this material for one hour. Furthermore, the remaining decommissioning activities will be conducted in radiologically controlled processes that ensure airborne dispersal of radioactive particulate material is minimized or prevented.

The radiological gaseous effluent limit for H-3 and all radioactive materials in particulate form is based on a release rate corresponding to 1500 mrem/yr using the LACBWR ODCM model. A conservative calculation was performed using this model that assumed a non-mechanistically generated particulate airborne dispersion equal to 30% of twice the characterized source term activity. The calculation produced a maximum dose of 7 mrem/yr. This indicates that the potential mechanistically generated dose rate from particulates is less than 1500 mrem/year.

It is concluded that a mechanistically generated airborne release corresponding to 1500 mrem/yr is not credible. Furthermore, the remaining activity is in a form such that the concept of a "loss of control" would only apply to the small quantities that are being actively processed during decommissioning.

Liquid Radioactivity Release

There is some contaminated water inside the LSE. However, the bulk of the radioactive material remaining inside the LSE is particulate material that is dry and not readily dispersible. There is a liquid release tank that has a capacity of 6000 gallons. The tank activity will be procedurally limited to $\leq$ 3.9E-03 µCi/cc. This limits the total activity available for release to less than 1 Ci.

The radiological liquid effluent limit is set at 50% of the10 CFR 20 limits. The release rate will be procedurally limited to a value that results in liquid effluent concentrations that are $\leq$ 50% of the 10 CFR 20 limits with the tank upper bound concentration of 3.9E-3 µCi/cc. In order to exceed twice the limit, the procedural constraints would have to be exceeded by a factor of 4 (because procedural constraints currently limit the release to 50% of the limit).

It is concluded that release rates corresponding to twice the liquid effluent limit are not credible.

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10 CFR 50.47(b), provides,

> *(12) Arrangements are made for medical services for contaminated injured individuals.*

10 CFR 72.32(a), provides in part,

> *(8) Notification and coordination. A commitment to and a brief description of the means to promptly notify offsite response organizations and request offsite assistance, including medical assistance for the treatment of contaminated injured onsite workers when appropriate.*

RAI 4:

After the LACBWR facility is decommissioned, will the ISFSI have the capability to perform decontamination or monitor for contamination?

RAI 4 Response:

The need for decontamination at the ISFSI is not expected during use of the NAC-MPC System as supported in the NAC-MPC FSAR. Contamination monitoring will be performed as needed.

NAC-MPC FSAR Section 7.A states the following:

> The MPC-LACBWR Transportable Storage Canister (TSC) provides confinement for its radioactive contents in long-term storage. The confinement boundary provided by the TSC is closed by welding, creating a solid barrier to the release of contents in the design basis normal conditions and off-normal or accident events. The welds are visually inspected and nondestructively examined to verify integrity.
>
> The TSC confinement system meets the requirements of 10 CFR 72.24 for protection of the public from release of radioactive material. The design of the TSC allows the recovery of stored spent fuel should it become necessary per the requirements of 10 CFR 72.122. The TSC meets the requirements of 10 CFR 72.122 (h) for protection of the spent fuel contents in long-term storage such that future handling of the contents would not pose an operational safety concern.
>
> The MPC-LACBWR TSC provides an austenitic stainless steel closure design sealed by welding, precluding the need for continuous monitoring. The analysis for normal conditions and off-normal or accident events demonstrates that the integrity of the confinement boundary is maintained in all the evaluated conditions. Consequently, there is no release of radionuclides from the TSC resulting in site boundary doses in excess of regulatory requirements. Therefore, the confinement design of the MPC-LACBWR system meets the regulatory requirements of 10 CFR 72 [AI] and the acceptance criteria defined in NUREG-1536 [A2].

NAC-MPC FSAR Section 10.A.2.2 states the following:

> There are no design basis events that result in the tip-over of the MPC-LACBWR storage cask or the release of any radioactive material from the canister.

NAC-MPC FSAR Section 11.A.1.5 states the following:

> The procedures for loading the canister provide for steps to ensure that the canister exterior surface does not come into contact with contaminated spent fuel pool water. The exterior surface of the canister is surveyed by smear to verify canister surface conditions. No particulate release from the canister exterior surface is expected to occur in normal use.

NAC-MPC FSAR Section 11.A.1.5.4 states the following:

> Procedural steps are employed to ensure that the canister surface is generally free of surface contamination prior to its installation in the storage cask. The surface of the canister is free of traps that could hold contamination. The presence of external surface contamination on the canister is unlikely.

Enclosure 1, Section 3.0 Proposed Changes, page 7 of 11, provides in part,

> *A change is made from the previous Revision 31 in that the E-Plan exercise will be conducted biennially in accordance with 10 CFR 50, Appendix E (IV)(F)(2)(b).*

RAI 5:

What is the technical basis for the change from an annual exercise as it was originally approved by the NRC on July 8, 1988 in Revision 10 of the Emergency Plan?

RAI 5 Response:

As it was explained in the License Amendment Request for Proposed Revision of Emergency Plan, Description and Evaluation of Changes, a change is made from the previous Revision 31 in that the E-Plan exercise will be conducted biennially in accordance with 10 CFR 50, Appendix E (IV)(F)(2)(b). The technical basis for this change is to make LACBWR emergency planning consistent with the requirements found in regulation.

In the SER for the issuance of emergency planning exemptions the following information is documented:

> (4.3.34) 10 CFR Part 50, Appendix E, Section IV.F.2.a.
>
> ~~a. A full participation exercise which tests as much of the licensee, State, and local emergency plans as is reasonably achievable without mandatory public participation shall be conducted for each site at which a power reactor is located. Nuclear power reactor licensees shall submit exercise scenarios under § 50.4 at least 60 days before use in a full participation exercise required by this paragraph 2.a.~~
>
> The 2011 EP Final Rule revised Section IV.F.2.a to require nuclear power reactor licensees to submit scenarios for their onsite biennial exercises under 10 CFR 50.4. This requirement was revised to enable the NRC to verify that licensees would implement in their exercise scenarios the requirements of Appendix E, Sections IV.F.2.i and IV.F.2.j, including "hostile action" and a variety of challenges to reduce preconditioning of responders.
>
> In 1988, the NRC approved the LACBWR Emergency Plan, which eliminated offsite emergency planning requirements. This approval exempted DPC from the requirement in 10 CFR Part 50, Appendix E, Section IV.F.2.a to conduct full participation exercises. In granting this exemption, the NRC relied on the factors and conclusions discussed in section 4.2.2 above.
>
> Because DPC does not have to conduct full participation exercises, it does not need to comply with the requirement that the exercise scenarios for those full participation exercises need to be submitted to the NRC. Based on these reasons and the analysis in section 4.2.2, the staff concludes that DPC is exempt from the requirement, "Nuclear power reactor licensees shall submit exercise scenarios under § 50.4 at least 60 days before use in a full participation exercise required by this paragraph 2.a," in 10 CFR Part 50, Appendix E, Section IV.F.2.a.

(4.3.35) 10 CFR Part 50, Appendix E, Section IV.F.2.b.

b. Each licensee at each site shall conduct a subsequent exercise of its onsite emergency plan every 2 years. ~~Nuclear power reactor licensees shall submit exercise scenarios under § 50.4 at least 60 days before use in an exercise required by this paragraph 2.b. The exercise may be included in the full participation biennial exercise required by paragraph 2.c. of this section.~~ [1988 exemption] In addition, the licensee shall take actions necessary to ensure that adequate emergency response capabilities are maintained[.] ~~during the interval between biennial exercises by conducting drills, including at least one drill involving a combination of some of the principal functional areas of the licensee's onsite emergency response capabilities. The principal functional areas of emergency response include activities such as management and coordination of emergency response, accident assessment, event classification, notification of offsite authorities, assessment of the onsite and offsite impact of radiological releases, protective action recommendation development, protective action decision making, plant system repair and mitigative action implementation. During these drills, activation of all of the licensee's emergency response facilities (Technical Support Center (TSC), Operations Support Center (OSC), and the Emergency Operations Facility (EOF)) would not be necessary, licensees would have the opportunity to consider accident management strategies, supervised instruction would be permitted, operating staff in all participating facilities would have the opportunity to resolve problems (success paths) rather than have controllers intervene, and the drills may focus on the onsite exercise training objectives.~~ [1988 exemption]

The staff concludes that DPC is exempt from the requirement, "Nuclear power reactor licensees shall submit exercise scenarios under § 50.4 at least 60 days before use in an exercise required by this paragraph 2.b" of 10 CFR Part 50, Appendix E, IV. F.2.b based on the staff's analysis in sections 4.2.2 and 4.3.34 above.

E-Plan Section 8.3 addresses the required biennial exercise and drills by stating:

> Between exercises (which are conducted every other year), at least one drill shall be conducted that involves a combination of some of the principal areas of on-site response capabilities such as management, accident assessment, protective and corrective actions.

By strikethrough of regulation indicated above, the NRC has established that LACBWR shall conduct an exercise of its on-site emergency plan every 2 years. As stated in the E-Plan, LACBWR will perform a biennial exercise that requires notifications to local, State, and Federal organizations. Between years, a drill will be conducted that involves on-site response capabilities.

By letter dated July 31, 2013, the NRC approved exemptions to specific emergency planning requirements in 10 CFR 50.47 and Appendix E to Part 50 for the La Crosse Boiling Water Reactor Facility. The La Crosse Boiling Water Reactor facility is the holder of Possession Only License No. DPR-45 which a Part 50 license and is subject to the emergency planning regulations as exempted.

Enclosure 2, Section 1.0 Introduction, page 1 of 1, provides in part,

This document describes the plan established by Dairyland Power Cooperative (DPC) for responding to emergencies that may arise at the La Crosse Boiling Water Reactor (LACBWR) Independent Spent Fuel Storage Installation (ISFSI).

RAI 6:

Please provide the emergency plan as exempted for the La Crosse Boiling Water Reactor facility.

RAI 6 Response:

E-Plan Revision 31, dated May 2011, reflects earlier exemptions identified by the NRC and is enclosed. E-Plan Revision 31 may not reflect all specific exemptions to emergency planning requirements granted by the NRC by letter dated July 31, 2013.

It is important to note that in the SER for the issuance of emergency planning exemptions dated July 31, 2013, DPC is exempt from having an emergency plan that describes the normal operating organization for a nuclear power plant, and that DPC is exempt from having an emergency plan that describes the onsite ERO staff emergency assignments for a nuclear power plant.

In the SER the following is stated:

(4.3.8) 10 CFR Part 50, Appendix E, Section IV.A.1

1. A description of the normal plant operating organization.

   DPC does not operate a nuclear power plant, and the NRC-approved LACBWR Emergency Plan provides a description of the normal operating organization for the LACBWR ISFSI. Because the LACBWR ISFSI is not a nuclear power plant and DPC satisfies the requirement in 10 CFR Part 50, Appendix E, Section IV.A.1 for its ISFSI, the NRC staff concludes that DPC is exempt from the requirement in 10 CFR Part 50, Appendix E, Section IV.A.1 to have an emergency plan that describes the normal operating organization for a nuclear power plant.

(4.3.9) 10 CFR Part 50, Appendix E, Section IV.A.2.b

b. Plant staff emergency assignments;

   DPC does not operate a nuclear power plant, and the NRC-approved LACBWR Emergency Plan provides a description of the onsite ERO for the LACBWR ISFSI, including the staff emergency assignments. Because the

LACBWR ISFSI is not a nuclear power plant and DPC satisfies the requirement in 10 CFR Part 50, Appendix E, Section IV.A.2.b for its ISFSI, the NRC staff concludes that DPC is exempt from the requirement in 10 CFR Part 50, Appendix E, Section IV.A.2.b to have an emergency plan that describes the onsite ERO staff emergency assignments for a nuclear power plant.
