UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 4, 2011

LICENSEE: Pacific Gas and Electric Company

FACILITY: Diablo Canyon Power Plant, Units 1 and 2

SUBJECT: SUMMARY OF FEBRUARY 3, 2011, THIRD PRE-LICENSING, PHASE 0 MEETING WITH PACIFIC GAS AND ELECTRIC COMPANY TO DISCUSS THE ARCHITECTURE FOR THE DIGITAL UPGRADE REPLACEMENT OF THE EAGLE 21 PROCESS PROTECTION SYSTEM (TAC NOS. ME5284 AND ME5285)

On February 3, 2011, the U.S. Nuclear Regulatory Commission (NRC) staff conducted a Category 1 public meeting with representatives of Pacific Gas and Electric Company (PG&E), licensee for Diablo Canyon Power Plant (DCPP), Units 1 and 2, at the PG&E Energy Center, 6588 Ontario Road, San Luis Obispo, California. The purpose of the meeting was to discuss the architecture that PG&E will propose to the NRC for the replacement of the Eagle 21 portion of the DCCP process protection system. This was the third pre-licensing, Phase 0 meeting regarding this digital upgrade with Phase 0 signifying the pre-application phase of the license amendment request (LAR) proposal process as determined in Interim Staff Guidance (ISG)-06[1]. A list of attendees is enclosed.

The NRC staff first presented a briefing providing an overview of the meeting's purpose, context, discussion topics, and content of ISG-06 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML110380104). This presentation also provided guidance for the public's participation in this meeting.

The licensee then presented information in a briefing tilted, "Diablo Canyon Power Plant Process Protection System Replacement, Third Phase 0 Meeting," dated February 3, 2011 (ADAMS Accession No. ML110380109). The licensee discussed the vendor platform updates, cyber security, its project plan and schedule including the ISG-06 documentation submittal, its LAR, and specific technical topics. A summary of these discussed topic areas is provided below:

Platform Updates

The licensee, with its accompanying vendors, provided the status on the development and document submittal of the two platforms PG&E intends to install for this upgrade.

[1] U.S. Nuclear Regulatory Commission, Digital Instrumentation and Controls, DI&C-ISG-06, "Task Working Group #6: Licensing Process," Interim Staff Guidance (ADAMS Accession No. ML110140103).

The Invensys Tricon V10 platform had a facility audit in December 2010 with no current technical issues noted. Six requests for additional information (RAIs) were received by the vendor in November 2010 for the vendor's topical report under review by the NRC staff with answers provided in January 2011. The NRC staff provided feedback that the vendor's topical report is on track for issuance in June 2011.

The Westinghouse Advanced Logic System (ALS) platform was approved for use with the Wolf Creek Generating Station Main Steam and Feedwater Isolation (MSFIS) license amendment[2]. The vendor stated that modifications from the Wolf Creek submittal are required for diversity and defense-in-depth (D3) due to NRC feedback regarding the need for plant-specific D3 analysis despite general reviews underway for the vendor's topical report and for the NRC Office of New Reactors (NRO). The NRC staff expects to issue RAIs for the ALS platform in February 2011 and perform a facility audit in March 2011. The vendor's topical report issuance could only occur in July or August 2011 at the earliest with multiple dependencies on the vendor's RAI response and quality of further submittals.

Cyber Security

The licensee and the NRC staff discussed the licensee's submittal for compliance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 73.54, "Protection of digital computer and communication systems and networks," and NRC Regulatory Guide (RG) 1.152, Revision 2, "Criteria for Digital Computers in Safety Systems of Nuclear Power Plants." The NRC staff provided awareness to the licensee of Revision 3 to RG 1.152 in development which will address the secure development and operational environment (SDOE) and is scheduled for issuance in June 2011. The SDOE changes will discuss digital system reliability and availability but not necessarily the efficacy of any cyber security features. The NRC staff explained that any DCPP Reactor Protection System (RPS) and Engineered Safety Feature Actuation System (ESFAS) design attributes intended to address cyber security would be reviewed and approved by the NRC Office of Nuclear Reactor Regulation (NRR) on the basis that the system will perform its safety function with these design features installed.

Project Plan and Schedule

The licensee and its supporting vendors provided to the NRC staff a review and status of the current platform designs and documentation development approach and flow. The NRC staff provided comments on the approach to include the quality of the current vendor submittals and which vendor submittals will require licensee-specific additions in the LAR to meet the document submission specificity needs of ISG-06.

The NRC staff desired specific clarification on the Software Development Process (SDP) for the Tricon V10 platform. The staff noted that the vendor's topical report did not currently include a description of the SDP that would be used for application software development. The licensee's vendor and NRC staff discussion clarified that SDP submission via the vendor's topical report for generic review was a viable approach as long as the licensee-specific LAR submittal

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[2] Singal, B. K., U.S. Nuclear Regulatory Commission, letter to Rick A. Muench, Wolf Creek Nuclear Operating Corporation, "Wolf Creek Generating Station - Issuance of Amendment Re: Modification of the Main Steam and Feedwater Isolation System Controls (TAC No. MD4839)," dated March 31, 2009 (ADAMS Accession No. ML090610317).

addresses site-specific software implementation procedures. The staff also noted that an application SDP had not been submitted with the vendor topical reports. The licensee stated that the Invensys SDP would be used for the DCPP Eagle 21 replacement project and would be submitted as part of the LAR.

The NRC staff and licensee discussed the content, tools to be used, and document submittal schedule and synchronization in relation to platform design completion, factory acceptance testing, verification and validation, site acceptance testing, and requirements traceability. The licensee and its vendors provided specific details on the timing and content of each level of product, software, and site testing and which documents will follow or accompany these milestones. While the NRC staff understood that the two different licensee vendors may name its documents differently, the documents must still meet the intent behind the ISG-06 required submittals.

The NRC staff, licensee, and licensee's vendors discussed the software quality assurance plans (SQAP) that are in place and for which vendor document products the SQAPs are applicable. The NRC staff specifically questioned if the licensee intends to submit a site-specific SQAP that is different or in addition to the vendor plans as this will add impact to the documents needed for review per ISG-06. The licensee stated its intention to credit the vendors' SQAPs from its topical reports, but the NRC staff may still perform a confirmatory review against the generic plan per Branch Technical Position (BTP) 7-14, "Guidance on Software Reviews for Digital Computer-Based Instrumentation and Control Systems." In addition, the NRC staff provided content feedback regarding the Invensys Nuclear System Integration Program Manual and its compliance with BTP 7-14. The staff informed Invensys and PG&E that the contents of this document are more in line with a project Quality Assurance (QA) plan and are not consistent with what would be expected for a generic, or project specific Software Program Manual.

The NRC staff provided clarification on the division of review and inspection responsibility between NRR and Region IV's inspection resources that occurs after factory acceptance testing.

License Amendment Request Submittal Discussion

The licensee and the NRC staff discussed multiple facets of the licensee's submittal content, quality, and schedule, especially in the construct of ISG-06, Enclosure B, "Information to be Provided in Support of a Digital I&C Upgrade License Amendment Request." Specifically, the staff and licensee performed a line-by-line review of the Phase 1 documents being developed to be submitted by the licensee specifically or one of the two platform vendors.

The NRC staff and the licensee discussed the data communications between the safety related (SR) TRICON V10 and ALS platforms with the non-safety related (NSR) maintenance workstation(s). The staff advised PG&E that the LAR submittal will need to provide a table addressing the 20 NRC Staff Positions within ISG-04[3] related to SR to NSR communications between digital platforms. Also, sufficient documentation of the NSR maintenance workstations

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[3] U.S. Nuclear Regulatory Commission, Digital Instrumentation and Controls, DI&C-ISG-04, "Task Working Group #4: Highly-Integrated Control Rooms—Communications Issues (HICRc)," Interim Staff Guidance (ADAMS Accession No. ML083310185).

and software would need to be available to the staff to verify compliance with ISG-04. Furthermore, the staff advised PG&E to utilize the format of ISG-06, Enclosure E, "Proposed Table of Contents for License Amendment Requests (LAR)" for the LAR submittal and ensure that its contents address all aspects of ISG-06, Enclosure D, "Sample Safety Evaluation of Digital I&C License Amendments." In addition, the LAR should address Institute for Electrical and Electronic Engineers (IEEE) Standard 603-1991, "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations" and IEEE 7-4.3.2, "Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations" on a clause by clause basis.

The NRC staff and the licensee discussed the LAR submittal approach in terms of the document submission requirement "tiers" described in ISG-06, Enclosure B. The licensee's initial plan was to submit its LAR in July 2011 referencing both vendors' software platforms as Tier 1 (i.e., generally approved by the NRC). This submission approach was predicated on an assumption that the Tricon V10 platform topical report (TR) would be issued by June 2011 (prior to the LAR submittal) and the ALS platform portion of the LAR submittal would reference the vendor's topical report in the final stages of NRC staff review. The NRC staff's feedback to this approach was that while the Tricon V10 approach was reasonable, the ALS approach did not meet the LAR submittal intentions and LAR acceptance criteria of NRR Office Instruction (LIC)-109, "Acceptance Review Procedures" (ADAMS Accession No. ML091810088). During further discussion, the staff informed the licensee that the ALS portion of the LAR submittal would need to be submitted as a Tier 3 component, and they should ensure all Phase 1 ALS documentation submitted (or referenced documents already submitted with the ALS Platform topical report) with the LAR satisfy a Tier 3 submittal per Enclosure B of ISG-06. If the ALS platform TR is approved prior to approval of the PG&E LAR, then the staff can reference the ALS portion of the LAR as a Tier 1 review based on the approved TR and following licensee submission of that same intention.

The licensee discussed with the NRC staff the possibility of having the staff commence ISG-06, Enclosure B supporting document review prior to the LAR submission in order to facilitate the LAR review in light of the ongoing vendor topical report reviews.

The NRC staff was asked if the final safety evaluation report (SER) for the DCPP Eagle 21 replacement project could be issued before the Integrated Factory Acceptance Test (FAT) Reports were issued. The staff informed PG&E that the FAT tests and summary reports are the final steps in the Independent Verification and Validation (IV&V) process required by BTP 7-14, and the staff depends heavily on the IV&V being completed satisfactorily before issuing a license to install a digital RPS/ESFAS system. Therefore, the FAT and summary reports would be needed, per ISG-6, for the staff to make its reasonable assurance determination and issue the SER.

Technical Topics

The NRC staff and the licensee discussed the technical details regarding the Maintenance Workstation Software, time base verification, and the use of isolators and signal conditioners. The staff clarified to the licensee that digital components still need to consider diversity and common cause failures.

Additional NRC Staff Comments and Actions

1. The NRC staff emphasized the importance of discussing the implementation of the data communications architecture between the Tricon V10 and ALS platforms in the licensee specific application at the same level as discussed in the vendor topical reports to include the non-safety connections. This discussion should include communication path conformance with ISG-04.

2. During the Cyber Security discussion, the licensee asked what impact the DCPP cyber security plan review by the NRC Office of Nuclear Security and Incident Response (NSIR) would have on the review and approval of the LAR, and if these two reviews could be performed in parallel since they may impact the same system. The NRC staff expressed the view that there is a potential impact on the licensee's LAR submittal review by the follow-on staff cyber security review. The NRC staff plans to evaluate with NRC management whether a parallel review by NSIR of the DCPP cyber security plan submittal is warranted.

3. The NRC staff plans to evaluate with NRC management and the NRC Office of the General Counsel (OGC) the feedback provided to the licensee regarding the ISG-06, Enclosure B interpretation to utilize a Tier 1 LAR documentation submission approach for the Tricon V10 platform and a Tier 3 approach for the ALS platform. In subsequent discussions with NRR management, the NRC staff concluded this would be a viable approach.

4. The NRC staff plans to discuss with NRC management the licensee's request to have the staff commence ISG-06, Enclosure B supporting document review prior to LAR submission. In subsequent discussions with NRR management, the NRC staff concluded this action would be inconsistent with internal NRC policies and procedures and should not be undertaken.

5. The NRC staff discussed with the licensee the staff plans to hold a fourth pre-licensing, Phase 0 public meeting within the final weeks prior to LAR submittal in order to allow the staff the opportunity to assess licensee readiness for LAR submittal and to understand documentation submittal completeness in meeting the ISG-06 requirements.

Twelve members of the public were in attendance. Two Public Meeting Feedback forms were received. Comments received included the following: the meeting was a productive working session but the participant was unable to find supporting information prior to the meeting; the participant commented favorably on project manager effectiveness in engaging the public and handling the meeting's technical content. These feedback forms have been forwarded to the NRR Senior Communications Analyst who will forward them to the Office of the Executive Director for Operations.

Please direct any inquiries to Jim Policikoski at 301-415-5430 or james.policikoski@nrc.gov.

for Alan Wang

Alan B. Wang, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-275 and 50-323

Enclosure:
List of Attendees

cc w/encl: Distribution via Listserv

LIST OF ATTENDEES

FEBRUARY 3, 2011, MEETING WITH PACIFIC GAS AND ELECTRIC COMPANY

ARCHITECTURE FOR THE DIGITAL UPGRADE REPLACEMENT OF THE

EAGLE 21 PROCESS PROTECTION SYSTEM

DIABLO CANYON POWER PLANT, UNITS 1 AND 2

DOCKET NOS. 50-275 AND 50-323

NRC Participants:

William Kemper, Senior Electronics Engineer, Instrumentation and Controls Branch
Richard Stattel, Senior Electronics Engineer, Instrumentation and Controls Branch *
James Polickoski, Project Manager, Plant Licensing Branch IV

Pacific Gas and Electric Company Participants:

Scott Patterson, Program Manager, Instrumentation and Controls Obsolescence
Philippe Soenen, Licensing Supervisor, Regulatory Services
Kenneth Schrader, Senior Engineer, Regulatory Services *
Kory Raftery, Media Relations Representative, Nuclear Communications
Chuck Lewis, Advising Engineer, Nuclear Quality Verification
George Hough, Cyber Security Supervisor, Strategic Projects-Cyber Security

PG&E Vendor Participants:

John Hefler, Altran Solutions
Ted Quinn, Altran Solutions
Bob Lint, Altran Solutions
Greg Clarkson, Altran Solutions*
Baruch Spence, CS Innovations
Scott Zimmerman, Invensys
Roman Shaffer, Invensys
Clayton Scott, Invensys
Brian Haynes, Invensys
Steve Sykes, Westinghouse
Jim Doyle, Westinghouse
Kyra Durinsky, Westinghouse
Steve Seaman, Westinghouse
Nick Norante, Westinghouse

Members of the Public:

Bill Patrick, Capri Technology
Sherry Lewis, Mothers for Peace
Joe Murray, Mission Technical
David Patty
Jane Swanson, Mothers for Peace
Ken Thompson, Avila Valley Advisory Council
Scott Barton, Gavial Engineering and Manufacturing
Elizabeth Apfelberg, Mothers for Peace
Gary Wilson, Cannon Corporation
Lindsay Fowler
Gordon Clefton, Nuclear Energy Institute *
Bill Fierbern, PLATTS*

* denotes participating via teleconference

Enclosure

Please direct any inquiries to Jim Polickoski at 301-415-5430 or james.polickoski@nrc.gov.

/RA by N. Kalyanam for/

Alan B. Wang, Project Manager
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Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-275 and 50-323

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List of Attendees

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JTrapp, EDO RIV
VDricks, OPA RIV
JPolickoski, NRR

ADAMS Accession No. Meeting Notice ML110190672 Meeting Summary ML110610589

OFFICE	DORL/LPL4/PM	DORL/LPL4/PM	DORL/LPL4/LA	DE/EICB/SEE	DORL/LPL4/BC	DORL/LPL4/PM
NAME	JPolickoski	AWang	JBurkhardt	WKemper	MMarkley	AWang (NKalyanam for)
DATE	3/3/11	3/3/11 (email)	3/3/11	3/3/11 (phone)	3/4/11	3/4/11

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