



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

May 14, 2010

LICENSEE: Pacific Gas and Electric Company

FACILITY: Diablo Canyon Power Plant, Units 1 and 2

SUBJECT: REVISED SUMMARY OF MARCH 3, 2010, MEETING WITH PACIFIC GAS AND ELECTRIC COMPANY TO DISCUSS DIGITAL UPGRADE AT DIABLO CANYON POWER PLANT, UNITS 1 AND 2 (TAC NOS. ME1778 AND ME1779)

On March 3, 2010, a Category 1 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of the Pacific Gas and Electric Company (PG&E, the licensee) at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. This was the second meeting held to discuss the digital upgrade of the reactor trip system and the engineered safety features actuation system at the Diablo Canyon Power Plant (DCPP). PG&E discussed the architecture that PG&E will propose to the NRC for the replacement of the Eagle 21 portion of the DCPP process protection system. A list of attendees is enclosed.

At the meeting, the licensee presented meeting slides entitled, "Diablo Canyon Power Plant, Process Protection System Replacement," dated March 3, 2010, which are available in the Agencywide Documents Access and Management System (ADAMS) Accession No. ML100690392. A summary of the items discussed at the meeting is provided below:

Scope

PG&E provided clarification of the scope of the proposed upgrade. The existing Eagle 21 system which provides trip status and parameter input signals to the Solid State Protection System (SSPS), which in turn performs the reactor trip and engineered safety feature actuation functions is to be replaced with a combination Tricon Triconex (software-based computer system) and CS Innovations Advanced Logic Systems (ALS) (field programmable gate array or FPGA-based) system. The licensee plans to retain the analog SSPS protection system for now. Therefore, the proposed modification is a partial reactor protection system upgrade that does not include the voter functionality which will continue to be performed by the SSPS system.

Diversity

The proposed design includes the use of the ALS FPGA technology for those safety functions that currently require manual operator actions (MOAs) in the event of a software common-cause failure. DCPP stated that the new system will rely on the built-in diversity capability of the ALS in order to eliminate the need for MOAs. As such, it will be necessary for the license amendment request (LAR) to reference the ALS topical report (TR) in order to credit its built-in diversity features. This TR is scheduled to be submitted to the NRC for a safety evaluation later this year. The signals requiring diversity include containment pressure, reactor coolant system

flow, and pressurizer pressure. The safety actuations requiring this diversity are containment spray, safety injection, and reactor trip.

Cross-Divisional Communications

The licensee stated that the proposed design will not include cross-divisional communication links. The DCCP design is maintaining communication independence between safety divisions. Also, because there is no voter function in the proposed design, there will be no requirement for interdivisional communications. This is expected to simplify the review process.

Non-Safety Related Maintenance Terminal

The DCCP design will have non-safety-related (NSR) maintenance terminals connected to the safety system at all times. There will be a separate maintenance terminal for each of the four divisions. Each of the proposed maintenance terminals will serve as the interface for both the Tricon system and the ALS system for the associated division.

Safety-related to NSR One-Way Communications

The proposed design includes a communications link to the existing Process Plant Computer (PPC) system. The licensee stated that this was to be a one-way communications pathway from the safety-related system to the PPC. The licensee also stated that to enforce this, one or more port aggregator devices, similar to devices previously approved for communication isolation, will be included in this design.

Class I to Class II Boundary

The proposed design also includes a fiber optic communication link from the Class I Tricon to a Class II Tricon Remote Chassis. This remote chassis will be classified as NSR and the communications link would be reviewed in a manner similar to the safety-related to NSR PPC links described above. This is a two-way communications link and the design details of this link including protocols, communication architecture, and communication software controls would be subject to a detailed evaluation by the NRC staff.

Software Development

PG&E stated the initial software development will be performed by the vendor Invensys. Upon turnover of the system to the licensee for operation, either PG&E or Invensys will perform the activities associated with software maintenance and operation. The NRC staff informed the licensee that because of this approach, the review would include an assessment of the licensee's software control programs, as well as coordination activities that would be necessary for both parties to maintain consistent configuration control over the systems software components.

Security

PG&E presented slides containing material covering both the security guidance addressed in Regulatory Guide (RG) 1.152, Revision 2, "Criteria for Digital Computers in Safety Systems of Nuclear Power Plants," and the cyber security regulation of Title 10 of the *Code of Federal Regulations* (10 CFR), Section 73.54, "Protection of digital computer and communication systems and networks." While the 10 CFR 73.54 regulation will ultimately be important for the utility to address, compliance to the regulation will not be included under the 10 CFR Part 50 licensing review. In addition, the NRC staff stated that the security provisions of RG 1.152 that cover the operational phases (i.e., Regulatory Positions 2.6 – 2.9) were expected to be removed in the next revision to the RG. The NRC staff noted that a focus of the Part 50 review would be on protection of the development environment (for both operating system and application software) from introduction of undocumented code, protection of the system's reliable operation from the effects of undesirable behavior of connected systems and protection of the system from unintended access. With regard to TRs that vendors may submit, the NRC staff noted that an essential item for the vendor was demonstration that the development environment was protected.

Additional NRC Staff Comments

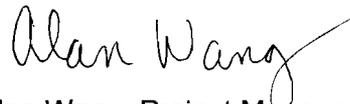
PG&E requested NRC feedback on the following specific items presented at the meeting:

1. The concept of allowing the maintenance terminal to be connected to the safety system at all times is feasible. The NRC staff approved this design concept in the Oconee Nuclear Station (Oconee) design by the licensee's demonstration that its design complied with the guidance in the NRC "Interim Staff Guidance, Digital Instrumentation and Controls, DI&C-ISG-04, Task Working Group 4, Highly Integrated Control Rooms-Communications Issues (HICRs)," Revision 1, dated March 6, 2009 (ADAMS Accession No. ML072540185) (ISG-4), or by providing acceptable alternatives to the guidance within its system design/development processes. However, it is noteworthy to mention that the NRC staff's approval of exceptions to ISG-4 guidance took additional time and resources by the NRC staff, licensee, and their vendor(s). Approval of this design concept required a detailed review of the Oconee Reactor Protective System and Engineered Safeguards Protective System data communications design, fault tolerance techniques, software controlling the communications to and from the service unit, etc., before the NRC staff could approve this concept. Accordingly, before the NRC staff could approve a similar communications design for the DCPD RPS upgrade, these same design details would be required for the NRC staff review.
2. The concept of allowing one loop at a time to be removed from service without having to also consider the other loops in the Protection Set/Channel as being removed from service also seems to be a viable concept, but the specific design details would be required for NRC staff review.
3. The DCPD review will be a tier 1 review as defined in the NRC's "Digital Instrumentation and Controls, DI&C-ISG-06, Task Working Group #6: Licensing Process, Interim Staff Guidance (Initial Issue for Use)" (ISG-06) (Enclosure 2 to the NRC's notice for the March 24, 2010, public meeting, ADAMS Accession No. ML093491083), assuming that

the Invensys and Westinghouse/CS Innovations TRs are approved on or before PG&E submits its LAR, and that PG&E's design does not deviate from the programs defined in these TRs. ISG-06 discusses these deviations and gives examples.

PG&E stated that it is approximately 20 months behind schedule and that the LAR supporting this change is now scheduled to be submitted in May 2011. The NRC staff noted that the priority for reviews is based on a first-in basis and that other licensees have indicated plans to submit licensing actions for digital upgrades. PG&E stated it plans to submit its defense-in-depth analyses shortly. The NRC staff reminded PG&E that the NRC will not accept for review any amendment that references an unapproved topical. Members of the public were in attendance, however, no public Meeting Feedback forms were received.

Please direct any inquiries to me at 301-415-1445, or Alan.Wang@nrc.gov.



Alan 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

MARCH 3, 2010, MEETING WITH PACIFIC GAS AND ELECTRIC COMPANY (PG&E)

DIGITAL UPGRADE OF EAGLE 21 SYSTEM

DIABLO CANYON POWER PLANT, UNITS 1 AND 2

DOCKET NOS. 50-275 AND 50-323

<u>NAME</u>	<u>AFFILIATION</u>
J. Hefler	ALTRAN
B. Haynes	INVENSYS
S. Zimmerman	INVENSYS
S. Sykes	INVENSYS
E. Quinn	ALTRAN
S. Sorensen	CS Innovations
C. Vitalbo	Westinghouse
G. Clefton	Nuclear Energy Institute
D. Raleigh	Sciencetech
K. Schrader	PG&E
S. Patterson	PG&E
R. Stattel	NRC
W. Kemper	NRC
A. Wang	NRC
N. Carte	NRC
G. Singh	NRC
T. Mossman	NRC
S. Wyman	NRC

Enclosure

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/RA/

Alan Wang, Project Manager
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Division of Operating Reactor Licensing
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Docket Nos. 50-275 and 50-323

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SWyman, NRR/DE/EICB
CSteger, NRR
LTrocine, EDO RIV

ADAMS Accession Nos. Meeting Notice ML09209415, Meeting Summary ML101260206, Handouts ML092440508

OFFICE	NRR/LPL4/PM	NRR/LPL4/LA	NRR/LPL4/BC	NRR/LPL4/PM
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DATE	5/12/10	5/7/10	5/13/10	5/14/10

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