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Energy Systems

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DCP/NRC0427
Docket No.: STN-52-003

November 9, 1995

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTENTION: MR. R. M. GALLO

SUBJECT: REPLY TO A NOTICE OF NONCONFORMANCE:

REFERENCE: Letter, R. M. Gallo to N. J. Liparulo, "NRC Inspection No. 99900404/95-02, dated October 6, 1995

Dear Mr. Gallo:

The attachment to this letter provides the Westinghouse response to the referenced inspection report addressing the results of an audit conducted at the VAPORE test facility in Casaccia, Italy on July 24 through 26, 1995. The specific actions and response to the nonconformances identified in the reference letter are provided in the attachment.

We believe that the actions identified in the attachment provide suitable resolutions to the nonconformances identified in the reference letter. Please contact John Butler on (412) 374-5268 if you have any questions concerning this transmittal.

Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

/nja

Attachment

cc: T. R. Quay, NRC
D. Jackson, NRC
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R. A. Gramm, NRC
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N. J. Liparulo, Westinghouse

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Nonconformance 99900404/95-02-01

Section 9.0, "Quality Assurance Requirements" of WCAP-14112, "Automatic Depressurization System Test Specification (Phase B1)," Revision 2, and Section 7.0, "As-Built Records" of ENEA document AP600-GQ9402, "Quality Assurance Plan Description: AP600 Test Program Conducted at the VAPORE Plant in ENEA Cassacia (Phase B)," Revision 2, provide for and require the preparation and maintenance of VAPORE test facility as-built drawings which pertain to the thermal-hydraulic and structural parameters for code validation and calculation methodology verification efforts.

Contrary to the above, as-built drawings, as defined and stipulated in WCAP-14112 and AP600-GQ9402, had not been generated for AP600 ADS Phase B testing at VAPORE. (95-02-01).

Corrective Actions:

A Westinghouse audit of ENEA conducted June 6-9, 1995, also identified an issue concerning the as-built configuration documentation of the facility. Ansaldo was contracted to modify the facility for AP600 testing and was responsible for generating the appropriate documentation. Ansaldo prepared as built drawings of the facility and transmitted them to ENEA. However, questions on the procedures used in preparation of the drawings could not be answered with other documentation available at ENEA. Westinghouse initiated additional actions to resolve this issue with Ansaldo.

A Westinghouse review of all the documentation at Ansaldo offices, in Genoa, on July 19 and 20, 1995 revealed that Ansaldo used a combination of shop drawings and field measurements to create their as-built documents. An assessment was made of the elements used to define the as-built configuration of the ADS test facility as well as the supporting documentation on the procurement and fabrication of the piping sections. Westinghouse concluded the as-built documentation was in compliance with AP600 project requirements and that the requirements of Revision 2 of the Quality Assurance Plan have been satisfied. The process of establishing the final test configuration, dimensional characteristics, as indicated on the Ansaldo as-built drawings, was performed in a controlled manner. A summary of Westinghouse review at Ansaldo is attached.

Actions To Prevent Recurrence:

The nonconformance was a result of a lack of proper appreciation for, or documents defining, the process used to document the as-built configuration of the VAPORE AP600 modifications. A formal procedure has been developed within Westinghouse for secondary as-built drawings. Since the AP600 Design Certification testing has been completed, no further actions to prevent recurrence are considered necessary.

Schedule:

The Westinghouse assessment of the Ansaldo as-built documentation was completed August 2, 1995.

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Unresolved Item 99900404/95-02-02

During the inspection, the team reviewed the VAPORE test facility calibration records which provided evidence of traceability to the appropriate ENEA controlled SIT-certified standards. This review also provided evidence of the adequacy of the facility instrumentation calibration status during each testing phase. The team found, however, that the ENEA QA program does not include adequate measures to effectively control the calibration status of reference instruments or standards used for instrument calibration, as no provisions were in place to require re-calibration by SIT at the requisite intervals. This may have resulted in the introduction of uncertainties in the adequacy of calibration of test facility instrumentation which relied on these standards to establish and maintain their accuracy.

Pending confirmation by W that this lapse in the SIT-certified calibration interval for the ENEA standards did not undermine or adversely impact the VAPORE ADS test results, this issue will remain unresolved.

Actions to Resolve:

Action has been initiated to close Unresolved Item 95-02-02 , concerning instrument standards calibration interval. ENEA has submitted the seven instruments involved in AP600 test instrument calibration to a nationally certified calibration laboratory (ERG/ING/PITER Division).

Schedule:

As of October 26, 1995, five of the instruments have been checked and found to be within expected tolerances. The remaining two instruments will be tested by the end of November, 1995.

**Review of Ansaldo's Control of As-Built
Dimensions for VAPORE**

**Giuseppe Onnis, Giuliano Locatelli, Ansaldo - Bob Tupper, Westinghouse
July 19th and 20th, 1995**

Requirements documenting the installed configuration of the ADS test loop at the VAPORE facility were defined to Ansaldo in SOP-95-0141, dated June 26, 1995. They are restated in Revision 2 of ENEA Quality Assurance Plan AP600-GQ9402 issued May 25, 1995.

Section 7 of AP600-GQ9402 contains the requirements for as-built records. The requirements, and the documentation of the information required, is reviewed below.

Section 7.1 General

This section is an introduction that indicates as-built documents will be required for features that influence thermal-hydraulic and structural parameters of the test.

Section 7.2 Dimensions to be Recorded

This section lists the as-built features of the facility that are to be recorded

Pressurizer internal diameter, volume, and elevation

Dimension Control: Shop drawings created by Ansaldo for the fabrication of the vessel provide the dimensions required.

Internal diameter, lengths, bend radii, and elevations of main system piping and fittings

Dimension Control: Dimensions for inside and wall thickness are controlled by procurement to recognized standard (in this case ANSI B31.1). The relative elevations and dimensions of the sections is defined in the piping isometric.

References: Ansaldo design specification for VAPORE piping; VAP-0001SMPX-1201-000, Dec. 4, 1995
Ansaldo purchase specification for piping and fittings; VAP-0001-SMPX-1204-000
Ansaldo piping isometric drawing VAP.0001.DMLX.2250.001, Revision 1

Location of instruments

Dimension Control: The instruments are attached to fittings built into the pipe sections. Each fitting location is noted on the as-built isometric. The method of attachment is defined in the instrumentation specification.

References: Ansaldo piping isometric drawing VAP.0001.DMLX.2250.001, Rev. 1
Ansaldo instrumentation specification VAP 8000 SAPX 1001 000

Location and description of pipe supports

Dimension Control: Pipe support, both location and type, is defined on Ansaldo as-builts

References: Ansaldo drawing VAP.0001.DMLX.1258001 Rev. 1
and VAP.0001.DMLX.1259.001 Rev. 1

All the information needed to document the configuration of the facility is contained in Ansaldo manufacturing drawings, recognized fabrication standards, and Ansaldo as-built drawings.

Section 7.3 Method and Responsibilities

This section deals with the requirements for collecting field information as well as the qualifications for the person taking the field measurements. It also recognizes that where as-manufactured drawings are "available still applicable, it is not necessary to make new records". Ansaldo's documents were reviewed to determine the nature of the facility fabrication (shop vs. field construction) and ensure the piping subassemblies were fabricated and inspected in a controlled manner.

Dimension control in the shop fabrication process

Shop fabrication of the test loop consisted of prefabricated piping sections, orifices and spacers. Ansaldo had two subcontractors for construction of pipe sections. Impresa Mario Quadraccia was the primary subcontractor responsible for the design and installation of the main piping system. Caldareia Carpenteria Meccanica (CCM) performed the shop construction of pipe subsections.

The main piping is rated for 2900 psi at 690 °F; consequently, the fabrication process was tightly controlled. Control of the fabrication, including pipe dimensions, was evident from the following:

Quadraccia and CCM have been audited by ANSALDO. Audit reports #VAP-VR/002-A dated January 17, 1994 and VAP-VR-005 dated May 21, 1994 (in Italian) document the results of the audit.

Quadraccia issued a final fabrication report (VAP0001RMRX318000 dated July 20, 1994) indicating, among other things, a dimensional check according to the Ansaldo piping isometric VAP0001SMPLX1250 as a hold point.

Quadraccia prepared sketches showing subassemblies, dimensions, the bill of material, and a weld map. This information was assembled by Ansaldo into a controlled document VAP0001DMLX 1307000 dated March 25, 1994. It is the equivalent of a fabrication or manufacturing drawing.

Expected shop tolerances for piping fabrication, as shown on Quadraccia drawings, is ± 1.0 mm. As an example, the range on a 800 mm pipe section would be between 799 and 801 mm. Westinghouse required accuracy for measurements of pipe lengths is within a range of 20 mm. Machined parts (spacers, orifices) tolerances would be typical to 131.3 ± 0.05 mm. These tolerances are understood and do not appear on drawings.

A review of VAP0001DMLX 1307000 indicated that the piping should be considered a shop fabricated set of components. Of the 150 welds made to connect piping and fittings only 9 were completed on site. Piping sections were manufactured according to "shop" standards for quality control and record keeping. There was no need to repeat dimension measurements in the field.

Dimension Control in the Field Assembly Process

Onsite erection and assembly required a few minor changes to shop-fabricated assemblies. Where changes were required, Ansaldo's lead engineer performed dimension over checks. Changes were recorded by marking up, signing, and dating Quadraccia sketches from VAP0001DMLX 1307000, the fabrication drawing. A cover sheet attached to the mark-up indicated the measurements were made with a steel tape, and the expected accuracy is within a range of 10 mm. The marked-up sketches are designated N31.000 dated 21 November and 15 December 1994.

Section 7.4 Changes

This section requires that changes to the facility be recorded in the as-built documentation.

The piping design was defined for Phase B1 testing in drawings VAP.001.DMLX.1250.001 and 1260.001. To document the configuration of the Phase B2 test, the drawings were reissued as Revision 0 of drawings VAP.001.DMLX.2250.001 and 2260.001 showing the addition of the valves. Ansaldo generated Revision 1 of drawings VAP.001.DMLX.2250.001 and 2260.001 as-builts based on the fabrication drawing VAP0001DMLX 1307000 prepared by Quadraccia and the information from the field measurements documented in N31.000. These two drawings accurately represent the as-built condition of the facility. Revision 1 was signed and formally released January 31, 1995.