

August 26, 2014

Christophe Reullon, Quality Manager
Valinox Nucléaire
5, avenue du Maréchal Leclerc
21500 Montbard, France

SUBJECT: MULTINATIONAL DESIGN EVALUATION PROGRAM INSPECTION OF VALINOX
NUCLEAIRE REPORT NO. 99901447/2014-201 AND NOTICE OF
NONCONFORMANCE

Dear Mr. Reullon:

On July 7 to July 11, 2014, the U.S. Nuclear Regulatory Commission (NRC) staff along with regulators from the United Kingdom Office for Nuclear Regulation (ONR) and from the French L'Autorité de sûreté nucléaire (ASN) (the inspection team), conducted an inspection at the Valinox Nucléaire (Valinox) facility in Montbard, France. The purpose of the inspection was to assess Valinox's compliance with the quality assurance/quality control (QA/QM) criteria described in the Multinational Design Evaluation Program (MDEP) Vendor Inspection Cooperation Working Group (VICWG) Technical Report, TR-VICWG-03, "Common QA/QM Criteria for Multinational Vendor Inspection," Revision 1, dated January 20, 2014, and MDEP Protocol, VICWG-01, "Witnessed Joint and Multinational Vendor Inspection Protocol," Revision 2, dated March 20, 2014, respectively. The inspection also offered the inspectors an opportunity to pilot the VICWG draft documents to gain valuable insights into the effectiveness of application of the common QA/QM criteria to vendor inspections performed by a multinational inspection team.

Consistent with the protocol for conduct of these inspections, this report, and the findings herein, are being cited against the regulations of the inspection lead regulatory body, the U.S. Nuclear Regulatory Commission (NRC) which include provisions of selected portions of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," and 10 CFR Part 21, "Reporting of Defects and Noncompliance," as well as reference to the applicable common QA/QM criteria described in VICWG-03 draft inspection guideline.

This inspection specifically evaluated Valinox's implementation of their quality assurance program, including associated procedures and instructions, related to the fabrication and testing of safety-related steam generator (SG) tubes for the international commercial nuclear power market. The enclosed report presents the results of this inspection. During this inspection, the inspection team evaluated implementation of Valinox's quality assurance (QA) program with respect to the 15 specific criteria described in the VICWG-03 Topical Report. These criteria include:

1. Quality management system
2. Grading

3. Documentation of the quality management system
4. Control of documents and records
5. Responsibility and Leadership
6. Human resources
7. Process Implementation
8. Control of planning and implementation changes
9. Purchasing (including aspects of CSFI)
10. Control of implementation including Control of special processes
11. Monitoring and measurement of product and service
12. Assessment
13. Non-conformances
14. Corrective and preventive actions
15. Safety culture

This inspection report does not constitute NRC's or any other participating regulatory body's endorsement of your overall QA program.

During this inspection, NRC inspectors found four instances where the implementation of your Quality Assurance (QA) program failed to meet certain aspects of the above criteria. These include the failure to compensate for thermocouple accuracy in your heat treatment process, two examples of performing inadequate inspections, a failure to ensure records are stored properly, and a failure to perform required audits. The specific findings and references to the pertinent requirements are identified in the enclosures to this letter.

Please provide a written statement or explanation within 30 days from the date of this letter in accordance with the instructions specified in the enclosed Notice of Nonconformance. We will consider extending the response time if you show good cause for us to do so.

In accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's Rules of Practice, a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system, Agencywide Documents Access and Management System, which is accessible from the NRC Web site at <http://www.nrc.gov/readingrm/adams.html>. 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. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is

C. Reullon

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necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Sincerely,

Richard A. Rasmussen, Chief **/RA/**
Electrical Vendor Inspection Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99901447

C. Reullon

- 3 -

necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Sincerely,

Richard A. Rasmussen, Chief **/RA/**
Electrical Vendor Inspection Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99901447

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NRO-002

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NOTICE OF NONCONFORMANCE

Valinox Nucléaire
5, avenue du Maréchal Leclerc
21500 Montbard, France
Docket No. 99901447/2014-201

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Valinox Nucléaire (Vallinox) facility in Montbard, France, on July 7–11, 2014, certain activities were not conducted in accordance with NRC requirements which were contractually imposed on Valinox.

- A. Criterion XVII, “Quality Assurance Records” of Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,” to Title 10 of the Code of Federal Regulations (10 CFR) Part 50, “Domestic Licensing of Production and Utilization Facilities,” states, in part, that “Records shall be identifiable and retrievable. Consistent with applicable regulatory requirements, the applicant shall establish requirements concerning record retention, such as duration, location, and assigned responsibility.”

Paragraph 3.16.4, “Archive Rooms,” of Chapter 3.16, “Management of Quality Records,” of the Valinox Nuclear Quality Management Manual, Revision 13, dated September 25, 2013, states that “The archive rooms of VALINOX NUCLEAIRE keep the documents in good condition. For this purpose:

- access to the archives shall be controlled,
- the documents shall be protected from flood/water damage and rodent,
- the final certification documents shall also be protected from fire damage,
- documents shall be microfilmed if required and maintained in fireproof storage facilities.”

Contrary to the above, as of July 11, 2014, Valinox failed to provide an adequate storage location for safety-related records related to steam generator tubing. Specifically, Valinox’s A and B Archive facilities did not provide adequate environmental controls or protection from damage or loss.

This issue has been identified as Nonconformance 99901447/2014-201-01.

- B. Criterion X, “Inspections,” of Appendix B to 10 CFR Part 50 states, in part, that “A program for inspection of activities affecting quality shall be established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures and drawings for accomplishing the activity.”

Paragraph 3.10.1, “Receiving of Source Materials,” of Chapter 3.10, “Inspections and Tests,” of the Valinox Nuclear Quality Management Manual, Revision 13, dated September 25, 2013, states that when any anomalies are disclosed by this inspection, they shall be reported on the Receiving Inspection Report and the Supplier Surveillance Manager will deal with all discrepancies in accordance with chapter 3.13, “Management of nonconforming Product.”

Enclosure

Section 3.10.2.1, "Production Follow-up" of the Valinox Quality Manual states in part that "The inspection operations and operations with a hold or witness point shall be performed and recorded by Quality Controllers (CQ)."

Contrary to the above two examples of Valinox's failure to adequately implement and document these required inspection activities were identified.

- 1) As of July 11, 2014, the Valinox receipt inspection team did not adequately identify and record the disposition of out of tolerance surface imperfections on received raw billets on a Receiving Inspection Report. This action was required per Valinox procedure PAM100, "Base Material Receipt Inspection," Section 3, which describes the process of documenting any nonconformance identified during receipt inspection of base material on "Rapport De Controle De Reception," form PAM100 Revision 4, Annexe 2, which is processed in accordance with PAM130, "Management of Nonconformance Reports."
- 2) As of July 11, 2014, portions of data sheets for Procedure TTH 973, "Thermal Treatment for Doosan, APR1400 straight tubes", Revision 01, dated May 22, 2013, were not verified by Quality Control or by any other second verification. This action was required per Valinox procedure TTH 973, "Thermal Treatment for Doosan, APR1400 straight tubes", Revision 01, dated May 22, 2013, which requires Quality Control to verify information recorded on the heat treatment data sheet.

These issues have been identified as examples of Nonconformance 99901447/2014-201-02.

- C. Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50 states, in part, that "Measures shall be established to assure that special processes, including welding, heat treating, and nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements."

Doosan Heavy Industries Purchase Order Number 2009033852 Revision 0, for SHIN KORI Units 5 & 6, invokes Purchase Specification, N11008-160PS-1006, Revision 0. Section 4.4.2, "Thermal Treatment," of the Purchase Specification requires that the steam generator tubes shall be thermally treated at 716°C - 738°C.

Product Technical Specification from Dongfang Heavy Machinery - Product Specification NPS-XDP-SG001, "Procurement Specification of Thermally Treated Alloy SB-163 UNS N06690 Tubing" for XUDAPU Steam Generator, Section 5, "Manufacturing Requirements," states, in part, that thermal treatment cycle shall consist of heating of the tubes in a vacuum to 716°C – 738°C.

Contrary to the above, as of July 11, 2014, Valinox failed to ensure that documented thermal heat treatment temperature values accounted for measurement device uncertainties and therefore could not assure that the heat treatment was performed in accordance with the temperature requirements documented in Valinox Procedure, TTH 1010, "AP1000 SG Tubing Thermal Treatment," Section 3, "Thermal Treatment Time/Temperature Conditions," and Valinox Instruction, TTH 973, "Thermal Treatment Instruction Sheet," Revision 01, , as well as the procurement specifications.

This issue has been identified as Nonconformance 99901447/2014-201-03.

- D. Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50 states, in part, that "A comprehensive system of planned audits shall be carried out to verify compliance with all aspects of the quality assurance program..."

Valinox Quality Manual, section 3.17.1, "Quality Internal Audits" revision 13, requires that internal audits shall be scheduled such as all chapters of the Quality Manual are audited at least once each 12 months.

Contrary to the above, as of July 11, 2014, process number 106, "Purchase and External Inspection," was not effectively audited within a period of 2 years, between 2012 and 2014.

This issue has been identified as Nonconformance 99901447/2014-201-04.

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Chief, Electrical Vendor Inspection Branch Division of Construction Inspection and Operational Programs Office of New Reactors within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each noncompliance: (1) the reason for the noncompliance, or if contested, the basis for disputing the noncompliance; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid noncompliances; and (4) the date when your corrective action will be completed. Where good cause is shown, consideration will be given to extending the response time.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information.

If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

Dated this 26th day of August, 2014.

**U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NEW REACTORS
DIVISION OF CONSTRUCTION INSPECTION AND OPERATIONAL PROGRAMS
VENDOR INSPECTION REPORT**

Docket No.: 99901447

Report No.: 99901447/2014-201

Vendor: Valinox Nucléaire
5, avenue du Maréchal Leclerc
21500 Montbard, France

Vendor Contact: Christophe Reullon, Quality Manager
Tel.: +33 3 80 89 83 37
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Nuclear Industry Activity: Valinox Nucléaire, a subsidiary of Vallourec Group, fabricates steam generator and other primary system tubes and specialty equipment for the domestic and international commercial nuclear power industry. Their primary product, nickel alloy steam generator tubes, is produced to both Alloy 690 and Alloy 800 specifications. The Montbard facility has been in production since 1974 and is a supplier for both the existing and new build commercial reactor fleet.

Inspection Dates: July 7-11, 2014

Inspection Team Leader: Greg Galletti, NRO/DCIP/EVIB

Inspectors: Richard Rasmussen, NRO/DCIP/EVIB
Raju Patel, NRO/DCIP/MVIB
Victor Hall, NRO/DCIP/QVIB
Craig Lavender, ONR
Stuart Allen, ONR
Stéphane Gitkoff, ASN
Ludovic Battista, ASN

Observer: Julien Husse, MDEP Project officer

Approved by: Richard A. Rasmussen, Chief
Electrical Vendor Inspection Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

EXECUTIVE SUMMARY

Valinox Nucléaire
99901447/2014-201

The U.S. Nuclear Regulatory Commission (NRC) staff along with regulators from the United Kingdom Office for Nuclear Regulation (ONR) and from the French L'Autorité de sûreté nucléaire (ASN) (the inspection team), conducted an inspection at the Valinox Nucléaire (Valinox) facility in Montbard, France, on July 7-11, 2014. The purpose of the inspection was to assess Valinox's compliance with the quality assurance/quality management (QA/QM) criteria described in the Multinational Design Evaluation Program (MDEP) Vendor Inspection Cooperation Working Group (VICWG) Technical Report, TR-VICWG-03, "Common QA/QM Criteria for Multinational Vendor Inspection," Revision 1, dated January 20, 2014, and MDEP Protocol, VICWG-01, "Witnessed Joint and Multinational Vendor Inspection Protocol," Revision 2, dated March 20, 2014, respectively. This vendor inspection also provided an opportunity to verify that Valinox implemented an adequate quality assurance program that complies with the requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," and 10 CFR Part 21, "Reporting of Defects and Noncompliance." In addition, the inspection offered the inspectors an opportunity to pilot the VICWG draft documents to gain valuable insights into the effectiveness of application of the common QA/QM criteria to vendor inspections performed by a multinational inspection team.

This inspection specifically evaluated Valinox's fabrication, inspection, and testing of safety-related Steam Generator Tubes for new construction commercial nuclear plants.

The following criteria served as the bases for this MDEP inspection:

- Technical Report, TR-VICWG-03, "Common QA/QM Criteria for Multinational Vendor Inspection," Revision 1, dated January 20, 2014, and

For issues cited in this inspection report

- Appendix B to 10 CFR Part 50

The information below summarizes the results of this inspection.

Quality Management System and Organization (MDEP QA/QM Criteria 1, 2, and 5)

The inspection team concluded that Valinox applied appropriate organizational controls over activities affecting the quality of steam generator tubing. The inspection team concluded that the implementation of Valinox's quality management system was consistent with the MDEP common QA/QM standard, including Criterion I "Organization," and Criterion II "Quality Assurance Program," of Appendix B to 10 CFR Part 50. No findings of significance were identified.

Control of Documents and Records (MDEP QA/QM Criteria 3 and 4)

The inspection team identified one nonconformance of Valinox's failure to implement the requirements of Criterion XVII, "Records," of Appendix B to 10 CFR Part 50. The inspectors

cited Nonconformance 99901447/2014-201-01 for failure to provide an adequate storage location for safety-related records related to steam generator tubing. With the exception of the nonconformance noted above, the inspection team concluded that Valinox was consistent with the regulatory requirements of the inspection criteria.

Training and Qualification of Personnel (MDEP QA/QM Criterion 6)

The inspection team concluded that the implementation of Valinox's training and qualification program was consistent with the regulatory requirements of the inspection criteria. No findings of significance were identified.

Process Implementation & Control of Planning & Implementation Changes (MDEP QA/QM Criteria 7 and 8)

The inspection team concluded that the implementation of Valinox's controls over process implementation and planning and implementation changes related to the fabrication of steam generator tubing was consistent with the regulatory requirements of the inspection criteria. No findings of significance were identified.

Purchasing (MDEP QA/QM Criterion 9)

The inspection team identified one example of a nonconformance for Valinox's failure to adequately implement the requirements of Criterion X, "Inspection," of Appendix B to 10 CFR Part 50. The inspectors cited an example of Nonconformance 99901447/2014-201-02, for failure to identify and record the disposition of out of tolerance surface imperfections on received raw billets on the Receiving Inspection Report. With the exception of the nonconformance noted above, the inspection team concluded that the implementation of Valinox's receipt inspection program was consistent with the regulatory requirements of the inspection criteria.

Control of Implementation Including Control of Special Processes (MDEP QA/QM Criterion 10)

The inspection team identified one nonconformance for Valinox's failure to implement the requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50. The inspectors cited Nonconformance 99901447/2014-201-03 for failure to ensure thermal heat treatment temperature parameters accounted for measurement device uncertainties and remained within the specified technical and order requirements. With the exception of the nonconformance noted above, the inspection team concluded that the implementation of the Valinox's programs for the control of fabrication and special processes was consistent with the regulatory requirements of the inspection criteria.

Monitoring and Measurement of Product and Service (MDEP QA/QM Criterion 11)

The inspection team concluded that the implementation of Valinox's program controls over M&TE use for calibration and testing was consistent with the regulatory requirements of the inspection criteria. No findings of significance were identified.

Assessment (MDEP QA/QM Criterion 12)

The inspection team identified one nonconformance for Valinox's failure to implement the requirements of Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. The inspectors cited

Nonconformance 99901447/2014-201-04 for failure to perform an internal audit in a timely manner and failure to adequately complete all audit activities. With the exception of the nonconformance noted above, the inspection team concluded that the implementation of the Valinox's programs associated with internal audits was consistent with the regulatory requirements of the inspection criteria.

Non-conformances (MDEP QA/QM Criterion 13)

The inspection team concluded that the implementation of Valinox's program for the control of non-conformances was consistent with the regulatory requirements of the inspection criteria. No findings of significance were identified.

Corrective and Preventive Actions (MDEP QA/QM Criterion 14)

The inspection team identified one example of a nonconformance for Valinox's failure to adequately implement the requirements of Criterion X, "Inspection," of Appendix B to 10 CFR Part 50. The inspectors cited an example of Nonconformance 99901447/2014-201-02 for failure to adequately implement inspection activities associated with corrective actions for an issue regarding independent verification of critical heat treatment parameters. With the exception of the nonconformance noted above, the inspection team concluded that the implementation of the Valinox's programs associated with internal audits was consistent with the regulatory requirements of the inspection criteria.

Safety Culture (MDEP QA/QM Criterion 15)

The inspection team generally observed a positive safety culture at Valinox. The inspectors attended various internal Valinox meetings, and noted Valinox staff's openness to raising and addressing issues related to safety and quality. The inspectors noted that Valinox management made provisions to support individuals and teams in carrying out their tasks safely and successfully, taking into account the interactions between individuals, technology, and organizations.

REPORT DETAILS

1. Quality Management System and Organization (MDEP QA/QM Criteria 1, 2, and 5)

a. Inspection Scope

The inspection team assessed Valinox's overall quality management system to ensure that it aimed to achieve and enhance safety by: (1) Bringing together all the quality requirements for managing the organization in a coherent manner, and; (2) Ensuring that quality requirements are not considered separately from safety requirements, and to help preclude their possible negative impact on safety. The inspection team reviewed Valinox's Nuclear Quality Management Manual, Revision 13, dated September 25, 2013, and implementing "Procedure d'Application du Manuel" (PAM) procedures of the quality management system.

The inspection team examined Valinox's organizational structure to ensure that the authority and duties of persons and organizations performing activities affecting the safety-related functions of structures, systems, and components were clearly established and delineated in writing. The team reviewed the written policies, procedures, or instructions that documented the quality management program, including the proper delegation of authority, and regular review of the status and adequacy of the quality management program. The inspection team evaluated the quality management's independence from cost and schedule when opposed to safety considerations, and evaluated whether quality management had direct access to the appropriate levels of management.

The inspection team interviewed Valinox personnel, including the Quality Manager to discuss roles and responsibilities related to ensuring the quality of safety-related steam generator tubes. The inspectors reviewed the authority of persons and organizations performing quality management functions to ensure that they have sufficient freedom to identify quality problems; to initiate, recommend, or provide solutions; and to verify implementation of solutions. Finally, the inspection team reviewed Valinox's application of quality assurance grading within the quality management system, which was limited to the production of safety-related steam generator tubing.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspection team found that Valinox applied appropriate organizational controls over activities affecting the quality of steam generator tubing. The inspection team concluded that the implementation of Valinox's quality management system was consistent with the criteria described in the MDEP Common QA/QM Criterion 1, "Quality Management System," Criterion 2, "Grading," and Criterion 5, "Responsibility and Leadership," respectively. No findings of significance were identified.

2. Control of Documents and Records (MDEP QA/QM Criteria 3 and 4)

a. Inspection Scope

The inspection team reviewed the implementation of Valinox's measures to control documents, which prescribe all activities affecting quality, such as instructions, and procedures, including changes thereto. The inspection team reviewed Valinox's requirements for records retention and storage, and examined details concerning record retention, such as duration, location, and assigned responsibility. The inspectors also visited Valinox's on-site archives facility.

The inspection team reviewed a sample of work packages associated with steam generator tubing, including completed packages, and in-process testing and production results. The inspectors examined Valinox's paper and computer systems for providing identifiable, retrievable, and reliable records of all activities affecting quality.

b. Observations and Findings

The inspectors noted that Valinox had procedures in place to control the location and archival storage of quality documents. Specifically, Paragraph 3.16.4, "Archive Rooms," of Chapter 3.16, "Management of Quality Records," of the Valinox Nuclear Quality Management Manual stated that:

"The archive rooms of VALINOX NUCLEAIRE keep the documents in good condition. For this purpose:

- access to the archives shall be controlled,
- the documents shall be protected from flood/water damage and rodent,
- the final certification documents shall also be protected from fire damage,
- documents shall be microfilmed if required and maintained in fireproof storage facilities."

PAM160, "Documents Retention," Revision 3, dated February 5, 2004, provided additional details regarding the storage locations of the various quality documents.

Contrary the above requirements, the inspectors determined that Valinox failed to provide an adequate storage location for safety-related records related to steam generator tubing. Specifically, Valinox's A and B Archives facilities did not provide adequate environmental controls or protection from damage or loss. This issue has been identified as Nonconformance 99901447/2014-201-01.

The inspectors noted that Valinox had issued Corrective Action Request (CAR) 13/017, on April 12, 2013, regarding this issue, following an audit by AREVA NP. The inspectors noted that AREVA requirements specified that records must be protected against humidity, light, temperature, fire, or protection against fire, flooding. The inspectors reviewed Valinox's plans to address this CAR, including a Valinox audit of a potential facility. However, the inspectors could not find objective evidence that the proposed storage facility met the records requirements of Appendix B to 10 CFR Part 50. The inspectors discussed Valinox's plans to address the issue, noting that Valinox refers to

NQA-1 in some instances, to meet the requirements of Appendix B. For single storage, NQA-1-2008 and the 2009 Addenda states that:

“Single storage consists of a storage facility, vault, room, or container(s) with a minimum two-hour fire rating. The design and construction of a single storage facility, vault room, or container shall be reviewed for adequacy by a person competent in fire protection or contain a certification or rating from an accredited organization.”

c. Conclusions

The inspection team identified one nonconformance for Valinox’s failure to implement the requirements of Criterion XVII, “Records,” of Appendix B to 10 CFR Part 50. The inspectors cited Nonconformance 99901447/2014-201-01 for failure to provide an adequate storage location for safety-related records related to steam generator tubing. With the exception of the nonconformance noted above, the inspection team concluded that Valinox’s program for document and record control were consistent with the criteria described in the MDEP Common QA/QM Criterion 3, “Documentation of the Quality Management System,” and Criterion 4, “Control of Documents and Records,” respectively.

3. Training and Qualification of Personnel (MDEP QA/QM Criterion 6)

a. Inspection Scope

The inspection team reviewed Valinox’s program and procedures for qualification and training of personnel performing activities affecting quality. The inspection team reviewed the training and qualification records for Valinox’s shop personnel, audit staff, and managers. The inspection team reviewed Valinox’s program, which assures that suitable proficiency is achieved and maintained. In addition, the inspection team discussed the personnel training and qualification process with Valinox’s management, interviewed personnel, and observed the mentoring within the training program.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspection team found that Valinox applied appropriate organizational controls over activities affecting the quality of steam generator tubing. The inspection team concluded that the implementation of Valinox’s training and qualification programs were consistent with the criteria described in the MDEP Common QA/QM Criterion 6, “Training and Qualification of Personnel.” No findings of significance were identified.

4. Process Implementation & Control of Planning & Implementation Changes (MDEP QA/QM Criteria 7 and 8)

a. Inspection Scope

The inspection team reviewed Valinox's quality management system and implementing procedures, including quality policy governing the translation of technical requirements and design bases into specifications, drawings, procedures and instructions including changes thereto to verify compliance with the MDEP requirements of Criteria 7, "Process Implementation," and Criteria 8, "Control of Planning and Implementation Changes." The inspection team reviewed the contract and associated purchase specifications for fabrication of steam generator tubes for Shanghai Electric's AP1000 SANMEN Unit 3 and Korea Hydro & Nuclear Power's (KHNP's) APR 1400 SHIN KORI Units 5 & 6.

The inspection team reviewed the roles and responsibilities for delegation of authority and interviewed Valinox's Responsible Products and Contracts Manager (RPC) designated by the Responsible Products Line Manager (RLGV) for the handling of various customer contracts associated with fabrication of steam generator tubes.

The inspection team also reviewed the process for implementing contract changes initiated by Valinox clients, which are handled through RPCs. When a RPC identifies changes or recommendations to procedures or specifications in a client's contract, Valinox forwards its customers a "Request for Clarification," with details of the proposed procedure or specification changes. Once the client approves the changes with hold or witness points, Valinox incorporates those changes in the new revision of Valinox documents. The inspection team confirmed that Valinox is using the latest approved procedures, specifications, and customer supplied drawings for fabrication; that appropriate quality standards were specified and included in purchase specification documents; that there is sufficient objective evidence of coordination and communication between Valinox and its client related to fabrication of the steam generator tubes, and that changes were being effectively controlled and approved.

The inspection team reviewed specifications for Shanghai Electric's SANMEN Unit 3 and KHNP's SHIN KORI Units 5 & 6. The inspection team examined/verified activities that include:

- Pre-contract communications
- Purchase orders
- Specifications
- Contract Review (learning pre-contract)
- Quality Plans – Including Material Specifications, Production Specifications
- Design variation/change
- Production Records
- Procedures

The attachment to this inspection report lists the documents reviewed by the inspection team.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspection team found that Valinox applied appropriate controls over process implementation and planning and implementation changes related to the fabrication of steam generator tubing. The inspection team concluded that the implementation of Valinox's programs in these areas were consistent with the criteria described in the MDEP Common QA/QM Criterion 7, "Process Implementation," and Criterion 8, "Control of Planning and Implementation Changes," respectively. No findings of significance were identified.

5. Purchasing (MDEP QA/QM Criterion 9)

a. Inspection Scope

The inspection team reviewed Valinox's arrangements for the purchase of products to support their manufacturing processes. The review included an assessment of Valinox's strategic suppliers, evaluation of performance and refreshment of supplier base in the context of their strategic drivers to deliver value savings while maintaining quality performance. Valinox identified that this could result in a refreshment of approximately 20% of their supply base per annum. The review also considered Valinox's arrangements to mitigate the risks of Counterfeit, Fraudulent and Suspect Items (CFSI) entering their supply chain or products.

The inspection team reviewed a sample of POs for Alloy 690 raw billets, hot extrusion tubes, and calibration services to ensure they included the regulatory requirements, design basis, and other applicable requirements in procurement documents for safety-related steam generator tubes for the AP1000 and APR 1400 steam generators. The inspection team examined a sample of certified material test reports for raw billets and certificates of compliance for services associated with the fabrication of steam generator tubes to ensure the raw materials and services received met Valinox PO requirements.

The inspection team reviewed Valinox's measures for supplier assurance and oversight including audits, inspection and evaluation processes and the qualification of those staff supporting the process. The inspection team reviewed a sample of external audits and Valinox's acceptance of those audits, to verify that Valinox appropriately qualified its suppliers. The inspection team reviewed the audits to verify that scheduled audits were performed using checklists that included an audit plan, audit results, documented objective evidence, and a review of audit results by responsible management, that the audits were performed at the minimum frequency as specified in the regulatory and Valinox requirements, and that follow-up action was taken where indicated.

The inspection team examined Valinox's process of receipt inspection of supplied items and services to ensure supplied items and services met the purchase and material specifications and that any discrepancies were adequately identified, recorded and dispositioned in accordance with the Valinox quality assurance program. The inspection team witnessed receipt inspection of an incoming lot of raw billets from one of Valinox's key suppliers of billets, Aubert & Duval and hot extrusion hollow tubes from the Salzgitter Mannesmann Stainless Tubes facility.

b. Observations and Findings

b.1. Receipt Inspection

The inspection team examined management system procedures associated with product acceptance and non-conformance control. Upon examination of a supplier nonconformance associated with receipt inspection of Nickel Alloy 690 billets, it was not clear how the Valinox receipt inspection team was recording the nonconformance on "Rapport De Controle De Reception," form PAM100, Revision 04, Annex 2.

Following discussion with the Valinox receipt inspection team and management staff, the inspection team was informed that on April 30, 2014, Valinox receipt inspection team had identified a nonconformance associated with surface imperfections that were outside the specified tolerance and was being progressed as appropriate. However, upon request for documented objective evidence of this nonconformance, Valinox was unable to provide the inspection team with a Rapport De Controle De Reception form that identified and recorded the disposition of this nonconformance issue as required by the inspection process.

This issue has been identified as one example of Nonconformance 99901447/2014-201-02 for failure to identify and record the disposition of out of tolerance surface imperfections on received raw billets in accordance with Valinox quality assurance program.

b.2. Counterfeit, Fraudulent and Suspect Items (CFSI)

The inspection team identified that while Valinox had measures in place to qualify and assess supplier performance, their knowledge of CFSI and associated mitigation measures could be improved. During an interview with Valinox's personnel regarding implementation of CFSI measures, the team observed that Valinox had experienced an example of CFSI within the fabrication activities. Valinox identified a failure of a ball bearing assembly used in a fabrication machine as being suspect. Upon investigation of the suspect ball-bearing, Valinox concluded that its material properties did not match the required specifications and that its origin could not be confirmed. Valinox could have done more to learn from this CFSI example, by taking steps that include: educating its personnel, raising awareness, strengthening its quality assurance measures, and sharing the experience within the organization, clients, supply chain, regulatory body, and wider industry as appropriate. The inspection team noted that this example did not directly impact product quality.

c. Conclusions

The inspection team identified an example of a nonconformance for Valinox's failure to adequately implement the requirements of Criterion X, "Inspection," of Appendix B to 10 CFR Part 50. The inspectors cited one example of Nonconformance 99901447/2014-201-02, for failure to identify and record the disposition of out of tolerance surface imperfections on received raw billets on the Receiving Inspection Report. With the exception of the nonconformance noted above, the inspection team

concluded that the implementation of Valinox's procurement program was consistent with the criteria described in the MDEP Common QA/QM Criteria 9, "Purchasing."

6. Control of Implementation Including Control of Special Processes (MDEP QA/QM Criterion 10)

a. Inspection Scope

Control of Fabrication Implementation

The inspection team reviewed a sample of "Carte De Controle par Attribut," for the week of May 24, 2014, which contained a daily log of attributes for each activity within the fabrication cycle which are documented by the operators and QC inspectors based on a set of surveillance procedures for those operations. For each attribute, the operators mark the status as either meeting or not meeting requirements for the particular process. The inspection team reviewed three cases of anomalies identified in the log related to the cold pilguring process, mill annealing, and hydraulic pressure test equipment and traced the disposition of each issue. In each case the vendor was actively pursuing corrective actions or had completed actions to assure conformance to the requirements.

The inspection team reviewed the project data report associated with SG Tubing for Shin Kori 5A – Unit 5, including "Declaration De Conformite" (NF EN 45014) which described the certification of various process activities including material verification, dimensional inspection, and results of ultrasonic (UT) and eddy-current (ECT) inspection activities. The team reviewed the UT and ECT Certification and confirmed that the test bench setup and examination requirements, including calibration standard requirements, were consistent with the required technical specification.

No issues of significance were identified

Handling, Storage, and Shipping

The inspection team reviewed Valinox's policies and implementing procedures that govern the handling, storage, and shipping program to verify compliance with the requirements of MDEP common international Chapter 10, "Control of Implementation." The inspection team reviewed the onsite storage and handling of materials which included the control and segregation of Nickel Alloys from carbon steel racks, and the support and protection for steam generator tubes currently in fabrication. The inspection team also reviewed the classification and use for the handling, storage, shipping, cleaning and preservation of steam generator tubes.

The inspection team observed packaging of Steam Generator Tube Set 5B in Box No. 22 of 32 for SHIN KORI Unit 5B, Doosan Heavy Industries PO No. 200903352 to ensure tubes were packed and laid out as specified in accordance with Valinox Procedure EMB-223, "Doosan APR1400 Steam Generator Tubing Bends Packaging Box Handling & Storage." The inspection team walked around the box and examined the labeling and handling symbols and confirmed the box was marked with handling symbols in accordance with Appendix 5 of EMB-223 requirements. The inspection team noted that the configuration of the box, use of plastic sheets, steam generator tube layout and support and protection with guide plugs were in accordance with EMB 223 requirements. In addition, the inspection team witnessed the final shipping and handling of Box No. 4 of

32 with Steam Generator Tube Set 5B for Doosan Heavy Industries PO No. 200933852, Valinox Order No. VN11016 loaded for shipment to offsite storage location.

The inspection team discussed the handling, storage, and shipping program with Valinox's management and technical staff. The attachment to this inspection report lists the documents reviewed by the inspection team.

No issues of significance were identified.

Heat Treatment

The inspection team reviewed procedures for final mill annealing and thermal treatment for the Alloy 690 tubes for the work in progress during the inspection period. For each heat treatment process, the procedures identified the temperature and duration requirements including heatup and cooldown rates, tube configuration and loading, furnace calibration settings, traceability requirements, visual and (micrographic inspection) and report requirements.

The inspection team verified that these heat treatment procedures incorporated the requirements from the procurement specifications associated with the on-going fabrication activities. The inspectors also verified that the procedures were also consistent with industry guidance incorporated by reference such as the Electric Power Research Institute (EPRI) guidance, "Guidelines of PWR Steam Generator Tubing Specifications and Repair," Volume 2, Revision 1, dated April 1999.

The inspection team also observed final mill annealing and thermal treatment of straight tubes and discussed implementation of the associated procedures with Valinox personnel. During these observations in the production area, the NRC inspection team confirmed that the heat treatment practices conformed to the procedures, and that selected parameters (e.g., temperature, pressure) were consistent with the procedures and were being continuously recorded where required. Calibration stickers or tags were examined on chart recorders, gages and thermocouples, and the inspection team verified calibration for a group of thermocouples used for these heat treatment processes.

Non-Destructive Examination (NDE)

The inspectors witnessed eddy current and ultrasonic testing of tubes on bench BCN-C9-162 and observed testing and evaluation of production tubes in accordance with the Valinox procedures for both eddy current and ultrasonic evaluations. The team observed the Valinox NDE personnel using the reference specimen with known defects to verify the evaluation system response associated with sampling of the specimen, and reviewed the fabrication report for the reference specimen.

The team reviewed the Dongfang Technical specification NPS-XDP-SG001, Section 6.6, "UT and ECT Examination for Defects in straight length tubes," to confirm technical requirements were being adequately translated into testing plans. The team confirmed that all required defects including, circumferential notches, flat bottom holes, and through wall holes of varying diameters were accounted for in the test plans.

Development and qualification of NDE calibration procedure UT/ECT

The inspection team verified that the working level procedures for NDE contained requirements for personnel qualifications, equipment qualification and calibration, conditions necessary for completing the process, and acceptance criteria. The inspection team noted that ECT, UT, and dimensional measurement procedures included reference to the test equipment and reference standards (i.e., construction and types of defects), examination bench set-up, calibration check frequency, data recording, methods for marking and sorting of samples, and acceptance criteria for the various examination techniques.

Qualification of NDE Test Personnel

The inspection team reviewed Valinox's documented practices associated with NDE personnel qualification and verified that it contained education, training and qualification requirements for NDE level I, II, and III personnel in accordance with the American Society of Nondestructive Testing (ASNT) SNT-TC-1A-2006, "Recommended Practice No. SNT-TC-1A, "Nondestructive Testing." The inspection team also verified training, experience, and qualification records of five NDE personnel certified as UT levels I, II, and III, and ET levels I, II, and III.

b. Observations and Findings

During the review of SG tube thermal heat treatment process, the inspection team identified an issue related to the use of thermocouples for measurement of the oven and tube temperatures. The team initially verified that the technical requirements and Valinox fabrication instructions for two orders (Doosan Heavy Industries and Dongfang Heavy Machinery) adequately and consistently documented the thermal temperature requirements as follows:

- Doosan Heavy Industries Purchase Order No. 2009033852 Revision 0, dated July 24, 2013, for SHIN KORI Units 5 & 6 invokes Doosan specification Number N11101F, Revision 2 with Purchase Specification Number N11008-160PS-1006, Revision 0.
- Valinox Procedure TTH-973, "Thermal Treatment," Revision 01, dated May 22, 2013 translated technical requirements from Section 4.4.2, "Thermal Treatment," of Doosan Specification NPS-11008-160PS-1006.. Section 4.4.2, "Thermal Treatment," specifies that the steam generator tubes shall be thermally treated at 716 °C - 738°C.
- Product Technical Specification from Dongfang Heavy Machinery - Product Specification NPS-XDP-SG001, "Procurement Specification of Thermally Treated Alloy SB-163 UNS N06690 Tubing" for XUDAPU Steam Generator, Section 5, "Manufacturing Requirements," states, in part, that thermal treatment cycle shall consist of heating of the tubes in a vacuum to 716°C – 738°C.
- Valinox Procedure, TTH 1010, "AP1000 SG Tubing Thermal Treatment," Section 3, "Thermal Treatment Time/ Temperature Conditions," item (b) requires a product holding temperature of 716°C – 738°C.

- Valinox Instruction, TTH 973, "Thermal Treatment Instruction Sheet," Revision 01, used to record tube bundle temperatures during fabrication activities specifies holding the temperature at 716°C - 738°C inclusively.
- EPRI TR-016743-V2R1, "Guidelines for PWR Steam Generator Tubing Specifications and Repair," Section 3.6.2, "Thermal Treatment," states in part that the tubing shall be heat treated at a temperature of (716°C +22°C, -0°C) for a 10 hour minimum.

The team confirmed that the various specifications, procedures, and instructions related to thermal heat treatment were consistent in specifying the temperature range requirements for performance of the thermal treatment as (716°C +22°C, -0°C), however, the recorded data for those treatments were not specifically adjusted to account for the uncertainly values associated with the thermocouples used for those temperature measurements. As a result, the actual temperatures may have varied by as much as +/-5°C (the allowable thermocouple uncertainty) from the recorded values. When questioned by the inspection team, the Valinox staff confirmed that the uncertainly values had not been considered in the recorded temperature measurements and therefore this could have potentially led to performing heat treatment on specific batches of tube bundles outside of the documented specified technical requirements of 716°C +22°C, -0°C) by as much as 5°C without identification. At the time of the inspection, the actual temperature values could not be definitively confirmed.

Although the vendor does have provisions in their non-conformance process to identify and resolve conditions where thermal treatment exceeds the minimum and maximum values required per the tube specification and order requirements, they had not previously self-identified this issue. Furthermore, the significance of this temperature departure on the material and chemical properties of the SG tubes, had not been formally evaluated by the vendor as part of initial qualification of the production runs.

This issue was also noted as being consistent with the European Pressure Equipment Directive (EPED) 97/23/CE and the French Order of 12 December 2005, which makes applicable, notably, all essential safety requirements of the EPED Annex 1. Part 2 in Annex 1 of the EPED is dedicated to design. It includes paragraph 2.2.3 (a) relating to Design for adequate strength / Calculation method / Pressure Containment and other loading aspects and states, in part, that:

"The allowable stresses for pressure equipment must be limited having regard to reasonably foreseeable failure modes under operating conditions. To this end, safety factors must be applied to eliminate fully any uncertainty arising out of manufacture, actual operational conditions, stresses, calculation models and the properties and behavior of the material."

As a result, any manufacturer shall eliminate fully any uncertainty arising out of manufacture, actual operational conditions, stresses, calculation models and the behavior of the material. It is applicable to the sample of tolerances of thermocouples and minimum/maximum temperatures to be maintained during any heat treatment which could impact the properties of the material.

This issue is identified as Nonconformance 99901447/2014-201-03.

c. Conclusions

The inspection team identified one nonconformance for Valinox's failure to implement the requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50. The inspectors cited Nonconformance 99901447/2014-201-03 for failure to ensure thermal heat treatment temperature parameters accounted for measurement device uncertainties and remained within the specified technical and order requirements. With the exception of the nonconformance noted above, the inspection team concluded that the implementation of the Valinox's programs for the control of fabrication and special processes was consistent with the criteria described in the MDEP Common QA/QM Criterion 10, "Control of Implementation Including Control of Special Processes."

7. Monitoring and Measurement of Product and Service (MDEP QA/QM Criterion 11)

a. Inspection Scope

The inspection team reviewed the implementation of Valinox's process for control of measuring and test equipment (M&TE). Specifically, the inspection team reviewed the policies and procedures governing the implementation of Valinox's process to verify compliance with Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50 and the MDEP Common QA/QM Criterion 11. The inspection team walked down the portions of the fabrication shop floors in UAP 1, 2, and 3 buildings to verify that measuring and testing equipment contained adequate labelling or other identification markings that identified the calibration status of the equipment.

The inspection team interviewed personnel responsible for the control and calibration of M&TE, reviewed the calibration history for a sample of M&TE, and reviewed the qualifications of calibration personnel.

The inspection team observed activities in the calibration laboratory, selected a representative sample of M&TE identified on test records, travelers, and instrument equipment lists for in-process job orders, and reviewed their calibration records for consistency and compliance to established procedures. The inspection team verified that the laboratory M&TE were calibrated using procedures traceable to known industry standards and traceable to certified equipment that has known valid relationships to nationally recognized standards. The inspection team also verified that the M&TE selected as a sample had appropriate calibration labelling, and that the records were available for review. Calibration records indicated that calibration procedures were followed; these records included information on, the accuracy required, the date of calibration, the tolerance values, and the due date for recalibration. The inspection team also reviewed the process for identifying and segregating equipment that is out of calibration or beyond repair. The inspection team verified that Valinox maintained adequate identification and segregation of out-of- tolerance equipment, and verified, through observation of ongoing calibration activities, that M&TE personnel who performed equipment calibration activities properly documented results and adequately labeled, handled, and stored calibration equipment.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspection team found that Valinox applied appropriate controls over M&TE use for calibration and testing. The inspection team concluded that the implementation of Valinox's M&TE program was consistent with the criteria described in the MDEP Common QA/QM Criterion 11, "Monitoring and Measurement of Product and Service."

No findings of significance were identified.

8. Assessment (MDEP QA/QM Criterion 12)

a. Inspection Scope

The team reviewed the implementation of the internal audit process. The team reviewed sample reports of internal audits conducted in 2012, 2013 and 2014 by Valinox. This review included planning, scheduling, implementation and follow-up. The team reviewed schedule adherence and the methods used to ensure audits are completed within the prescribed annual basis. The team also reviewed the process for documenting and tracking corrective actions. The list of documents reviewed is attached.

b. Observations and Findings

During the review of internal audits the team identified two issues related to Audit Report number 6 on process number 106, "Purchase and External Inspection." These two issues resulted in the audit of Purchase and External Inspection not being effectively completed over a two year period when an annual inspection is required.

Specifically, the team identified that Internal Audit Report number 6 on process number 106 "Purchase and External Inspection" Revision 00, conducted on 06 December 2013, was not conducted in accordance with the audit procedure checklist. The inspectors observed that half of the items listed in the report checklist were annotated as "not audited". This included items such as "assessing if second tier sub-contractors are being provided with all the QA and technical requirements by Valinox purchase department" and "assessing if Valinox personnel are qualified and available for adequate follow-up of the process." The team determined that these items were significant to the audit because of their potentially impact on the product quality.

The team also noted that this audit, although conducted in December 2013, was not reviewed and approved until 3 July of 2014. The team also noted that a second fully completed audit of this process was conducted and approved on 27 July 2014. Because the 2013 audit did not assess the full audit scope and because the audit was not reviewed by management and issued in 2013, the team concluded that this area was not effectively audited for a period of two years.

Following the identification of this finding, the team noted that Valinox issued Corrective Action Request-n°14/034, dated 10 July 2014, requesting that auditors must issue their audit report no later than 15 days following the audit.

The team also observed that Valinox had postponed the number 106 audit several times during 2013. Through discussions the inspectors learned that the audit was postponed because of available resources. The inspectors reviewed the 2012, 2013, and 2014

audit plans and observed that many audits were significantly postponed compared to their initial annual program plan. However, the team noted that Valinox addressed this issue in its internal 2014 Progress Plan with the objective of identifying the preventive actions to be implemented during the upcoming 2015 internal audit program.

The team considers that the delay of signing and issuing the audit report is significant and does not comply with early detection required by IAEA Safety Guide GS-G-3.1 §6.2. Additionally, the failure to complete this audit section annually as required by the Quality manual does not comply with the MDEP Common Criteria 12.1, Assessment, and has been identified as Nonconformance 99901447/2014-201-04.

c. Conclusions

The inspection team identified one nonconformance for Valinox's failure to implement the requirements of Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. The inspectors cited Nonconformance 99901447/2014-201-04 for failure to perform an internal audit in a timely manner and failure to adequately complete all audit activities. With the exception of the nonconformance noted above, the inspection team concluded that the implementation of the Valinox's programs associated with internal audits was consistent with the criteria described in the MDEP Common QA/QM Criterion 12, "Assessment."

9. Non-conformances (MDEP QA/QM Criterion 13)

a. Inspection Scope

The team reviewed the implementation of the Valinox non-conformance process. This included the process for identifying, documenting, dispositioning and tracking non-conformances. The team sampled a selection of non-conformance reports to assess the technical adequacy of the resolution and to assess corrective actions. The team visited various production stations in the factory to assess the implementation of the non-conformance process and to observe how non-conforming tubes were identified and controlled. The list of documents reviewed is attached.

b. Observations and Findings

One issue inspected in detail was a group of non-conformance reports related to automatic shutdowns of a furnace used to heat treat the tubes after formation. The inspectors reviewed the actions taken by Valinox to segregate, document, re-heat treat and evaluate any tubes that are in the oven at the time of a shutdown. The inspectors considered the process adequate.

Another issue inspected in detail was an issue involving errors detected in reading eddy current test data. A new contractor providing this service identified errors during a review of the data. The inspectors reviewed the evaluation of errors, the extent of condition review, and corrective actions. The inspectors considered the actions adequate.

The inspectors reviewed one non-conformance related to an error in placing thermocouples in tubing bundles in preparation for vacuum heat treating. In this case the inspectors reviewed the technical evaluation for the tube bundle involved as well as

the corrective actions to prevent recurrence. The inspectors considered the resolution of the technical issue adequate but identified inadequate corrective actions to prevent recurrence. The assessment of the corrective actions is provided in Section 10 below.

c. Conclusions

The inspection team concluded that the implementation of Valinox's program for the control of non-conformances was consistent with the criteria described in the MDEP Common QA/QM Criterion 13, "Non-Conformances."

No findings of significance were identified.

10. Corrective and Preventive Actions (MDEP QA/QM Criterion 14)

a. Inspection Scope

The team reviewed the implementation of the Valinox corrective action process. This included the process for identifying, documenting, dispositioning and tracking corrective actions. The team sampled a selection of corrective action reports to assess the technical adequacy of the resolution and to assess corrective actions. The list of documents reviewed is attached.

b. Observations and Findings

Valinox procedure TTH 973 controls the thermal treatment of tubing using vacuum heat treating. This procedure is project specific and provides the requirements for implementing the vacuum heat treating for a specific project. Procedure GTTV 10 provides requirements for operating the vacuum heat treatment oven and is used in concert with the project specific procedures. Procedure GTTV 10 requires Quality Assurance to verify the information recorded on the data sheet for each batch of tubes treated in the oven. This information includes the identification of the tubes, the configuration of the bundles within the oven, the thermocouple serial numbers and calibration, the thermocouple position and the connection of the thermocouples to the correct channels of the recorder.

The misplacement of the thermocouples was identified by Valinox in RNC 14/011. As a result of this RNC Valinox identified the lack of an independent verification as a cause of the error. An independent verification was not performed as required by the procedure because a quality control (QC) technician was not available at the time. As a corrective action Valinox implemented a requirement to have two qualified operators verify the critical information if QC is not available. However, the inspectors reviewed a sample of records and determined this corrective action was not being consistently implemented. On multiple occasions a single operator signed for the configuration and neither QC nor a second operator provided the required second check. TTH 973, Data sheet 14088 is one example of a data sheet that did not receive QC or a second operators review.

During discussions with Valinox the inspectors were told that QC personnel were not available on weekends and that a second qualified operator was also not always available on weekends. The inspectors also observed that the corrective action requiring the second qualified operator to verify the configuration was not imposed by a procedure change.

Based on the ineffective corrective actions Valinox had still not restored compliance with their Quality Requirements. The failure to perform required independent verifications is contrary to the MDEP Common Criteria 7.1, "Process Implementation." Additionally, the failure to take effective corrective actions is contrary to MDEP Common Criteria 14.1, "Corrective and Preventative Actions." The failure to restore compliance with requirements to perform independent verifications is identified as an example of Nonconformance 99901447/2014-201-02.

c. Conclusions

The inspection team identified an example of a nonconformance for Valinox's failure to adequately implement the requirements of Criterion X, "Inspection," of Appendix B to 10 CFR Part 50, that resulted from inadequate implementation of a previously identified inspection-related issue documented in the Valinox Corrective Action program. The inspectors cited Nonconformance 99901447/2014-201-02 for failure to adequately implement corrective actions associated with independently verifying critical heat treatment parameters during inspection activities. With the exception of the nonconformance noted above, the inspection team concluded that the implementation of the Valinox's programs associated with corrective actions was consistent with the criteria described in the MDEP Common QA/QM Criterion 14, "Corrective and Preventive Actions."

11. Safety Culture (MDEP QA/QM Criterion 15)

The inspection team generally observed a positive safety culture at Valinox. The inspectors attended various internal Valinox meetings, and noted Valinox staff's openness to raising and addressing issues related to safety and quality. The staff attended a bi-weekly management review meeting, which reviews product quality, production, and safety at the Valinox facility. The inspectors noted that Valinox management made provisions to support individuals and teams in carrying out their tasks safely and successfully, taking into account the interactions between individuals, technology and organizations. The inspectors noted that Valinox was responsive to issues, such as the cleanup of water that had entered the production facility.

Additionally the inspection team reviewed Valinox's output from the Management Review process that included a risk management process that clearly identified consideration of nuclear safety and product quality in its assessment and mitigation.

12. Entrance and Exit Meetings

On July 7, 2014, the inspectors presented the inspection scope during an entrance meeting with Mr. Jackie Couderc, Valinox Plant Manager, and other Valinox personnel. On July 11, 2014, the inspectors presented the inspection results during an exit meeting with Mr. Jackie Couderc, Valinox Plant Manager, and other Valinox personnel.

ATTACHMENT

1. PERSONS CONTACTED AND NRC STAFF INVOLVED:

Name	Title	Affiliation	Entrance	Exit	Interviewed
Greg Galletti	Team Leader	U.S. NRC	X	X	
Richard Rasmussen	Inspector	U.S. NRC	X	X	
Victor Hall	Inspector	U.S. NRC	X	X	
Raju Patel	Inspector	U.S. NRC	X	X	
Stuart Allen	Inspector	ONR UK	X	X	
Craig Lavender	Inspector	ONR UK	X	X	
Stéphane Gitkoff	Inspector	ASN	X	X	
Ludovic Battista	Inspector	ASN	X	X	
Julien Husse	Observer	MDEP	X	X	
Jackie Couderc	Plant Manager	Valinox	X	X	
Christophe Reullon	Quality Manager	Valinox	X	X	X
Alexandre Clouet	Quality Control Manager	Valinox	X	X	
Cécile Chapuis	Health & Safety Manager	Valinox	X		
Christophe Rabut	Human Resources Manager	Valinox	X	X	X
Anne-Claire Ollivier	Planning Manager	Valinox	X	X	
Blandine Bellart	Products & Contract Manager	Valinox	X	X	X
Marie-Agnès Gerrard	R&D, PEN Line Manager	Valinox	X	X	X
Claudia Carré	Human Resources	Valinox			X
Sébastien Breuil	Human Resources Deputy Manager	Valinox			X
Serge Montrichard	Steam Generator Product Line Manager	Valinox		X	X
Jean-Pierre Rebouillat	Sourcing Manager	Valinox			X
Pascale Chargrassé	Products & Contract Manager	Valinox			X

Name	Title	Affiliation	Entrance	Exit	Interviewed
Yann Guerrar	Receiving Inspector	Valinox			X
Nathalie Dianne	Subcontractor Manager/Receiving Inspector	Valinox			X
Marcelle Fontaine	Quality Assurance Technician	Valinox	X	X	X
Sylvie Guichard	Operator	Valinox			X
Camille Moulin	Maintenance Manager				X
M. Dussel	VMS Performance Analyst Continuous Improvement Manager	Valinox			X
Audrey Bochot	Thermal Treatment Technician				X
Thierry Piquet	UAP3 Quality Assurance Manager (RCQ UAP3)				X
Germain Camus	Valinox Nucléaire Laboratory and Environment Manager				X
S. Page	UAP3 Team Leader – Ilot A				X
Martine Suchette	UAP2 Vacuum Treatment Operator				X
J-Y Prou	UAP2 Drever Furnace Driver				X
Julien Canaux	UAP2 Quality Control Manager				X
K. Kirsch	Controller CND US/CF2				X
Brice Guebel	Controller CND US/CF2				X
Hicham El-Yazini	Operator CND US/CF1				X
J. P. Breton	Technician CND US/CF2				X
Romain Capiou	UT/EC Level III				X

2. INSPECTION PROCEDURES USED:

IP 43002, "Routine Inspections of Nuclear Vendors," dated July 2013

TR-VICWG-03, Technical Report, "Common QA/QM Criteria for Multinational Vendor Inspection," Revision 1, dated January 20, 2014

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Status</u>	<u>Type</u>	<u>Description</u>
99901447/2014-201-01	Opened	NON	Criterion XVII
99901447/2014-201-02	Opened	NON	Criterion X
99901447/2014-201-03	Opened	NON	Criterion IX
99901447/2014-201-04	Opened	NON	Criterion XVIII

4. DOCUMENTS REVIEWED:

Quality Manuals, Plans, Specifications, and Procedures

- Valinox Nuclear Quality Management Manual, Revision 13, dated September 25, 2013
- Valinox Application Procedures of the Quality Manual (PAM) 010, "Responsibilities and Delegations," Revision 5, dated September 12, 2013
- PAM050, "Management of Quality Documents and Data," Revision 7, dated October 17, 2013
- PAM051, "Management of Information Systems," Revision 3, dated January 4, 2010
- PAM052, "Quality Plan," Revision 1, dated January 16, 2003
- PAM063 "Evaluation of Performance of Products or Services Purchased," Revision, dated September 23, 1999
- PAM090, "Process Qualification," Revision 5, dated December 19, 2012
- PAM092, "Preparation and Filling out of the OFDS," Revision 5, dated May 17, 2010
- PAM100, "Base Material Receipt Inspection," Revision 5, December 16, 2013
- PAM-101, "External Inspections", Revision 5, dated November 25, 2009
- PAM 130, "Management of nonconformance reports," Revision 10, dated November 26, 2010
- PAM 140, "Corrective and preventive action," Revision 4, dated May 20, 2014
- PAM160, "Documents Retention," Revision 3, dated February 5, 2004

- PAM170, "Quality System Audits," Revision 8, dated January 28, 2014
- PAM180, "Training and Qualification," Revision 5, dated November 17, 2008
- PAM181, "Nondestructive testing training SNT-TC-1A," Revision 12, dated October 07, 2013
- PAM182, "Training and Qualification of Shop Inspectors," Revision 6, dated March 27, 2014
- PAM184, "Qualification of Auditors," Revision 5, December 17, 2012
- CF-265, "AP1000 SG Tubing Volumetric Soundness – Absence of ID Carburization and/or Pollution Eddy Current Examination," Revision 00
- CF-230, "Noise Eddy Current Examination (Internal Probe)," Revision 5, dated July 2, 2013
- CF-231, "U-Bent Tubes Eddy Current Baseline Examination," Revision 11, dated June 3, 2014
- CFG-126, "AP1000 Steam Generator Tubing U-Bent Tubes Eddy Current Baseline Examination for Alloy 690 (UNS N06690), Revision 0, dated February 7, 2014
- CFG-127, "U-Bent Tubes Eddy Current Inspection for Grade NC-30Fe," Revision 2, dated July 12, 2013
- CND-119, "NDT Personnel Qualification," Revision 2, dated March 3, 2014
- CPR-140, "Contaminants Surveillance Program," Revision 2, dated December 20, 2012
- CPR 167, "Contamination Surveillance Program, Revision 1, dated March 13, 2014
- CDIG 116, "SENPEC AP1000 SG Tubing Final Dimensional and Visual Inspection," Revision 1, May 15, 2014
- EMB-223, "Bends Packaging Box Handling & Storage," Revision 7, dated March 6, 2014 for Doosan Heavy SHIN KORI APR1400 Steam Generator Tubing
- EPG-108, "SEMPEC AP1000 Steam Generator Tubing, Hydrostatic Testing," Revision 0, dated January 23, 2014
- EPG 108, "Revision 00, January 23, 2014
- EQT-048, "Equivalence Technique," Revision 2, dated August 29, 2013
- ESS185, "Metallographic Examination," Revision 1, dated April 23, 2014
- ETA 06, "Verification Meterologique Des Couples Thermo Electriques," Revision 08, dated August 12, 2009
- PEC342, "Sampling & Destructive Testing, Revision 01, dated April 23, 2014

- TS 600, Degreasing control, Revision 3, August 01, 2012
- TS-760, "Cleaning/Cleanliness Check for UNS N06690," Revision 4, dated June 5, 2014
- TTH-471, "Final Mill Anneal," Revision 5, dated April 30, 2014
- TTH 600, "Intermediate Thermal Treatment," Revision 2, July 1, 2011
- TTH 973, "Thermal treatment for Doosan, APR1400 straight tubes," Revision 01, dated May 22, 2013
- TTH 974, "Thermal treatment for Doosan, APR1400 U tubes," Revision 01, dated May 22, 2013
- TTH-975, "Thermal Treatment," Revision 1," dated May 22, 2013
- US-344, "AP1000 SG Tubing – Volumetric Soundness OD/ WTH Ultrasonic Examination," Revision 0
- Laboratory Quality Manual Procedure LAB3290, "Discrepancies processing: clients requests, non-conformances, corrective and preventive actions," Revision 0, dated March 7, 2014
- Laboratory Quality Manual Procedure, LAB3000, "General procedure for laboratory quality system following requirements from standard NF EN ISO/CEI 17025," Revision 8, dated March 28, 2014
- GTTV 10, "Operator Instruction TIV vacuum treatment," Revision 0, dated March 29, 2014
- Valinox Instruction CVSTREBA, "Visual Reference Standard for Receiving Inspection of Hollow 13x 11mm tubes," Revision 1, dated December 4, 2013
- CVSTREBA, "Visual Reference Standard," Revision 3, April 12, 2013
- Valinox Quality Plan (QP)-656, "Quality Plan – Manufacturing and Inspection Test Plan for Doosan SHIN-KORI Units 5 & 6 Steam Generator Tubing," for Doosan Purchase Order No. 2009033852, Valinox Order No. VN11016, Revision 0, dated December 14, 2012

Specifications

- Valinox METG-101, "Specification for the Supply by Thyssenkrupp VDM of Raw Material in Nickel-Iron-Chromium Alloy 690 (UNS N06690)," Revision 5, dated February 28, 2012
- METG-102, "Specification for the Supply by Aubert & Duval of Raw Material in Nickel-Iron-Chromium Alloy 690 (UNS N06690)" Revision 5, dated February 28, 2012
- STRG-101, "Specification for Transformation of Bar & Billets into Hot Extruded Hollow," Revision 2, dated December 11, 2013

- Product Specification NPS-XDP-SG001, Procurement Specification of Thermally Treated Alloy SB-163 UNS N06690 Tubing for XUDAPU Steam Generator
- Doosan Heavy Industries Specification No. NPS-11101F," General Requirements for Code Material (for Foreign Company)," Revision 2, dated September 29, 2011
- Doosan Heavy Industries Purchase Specification No. N11008-160PS-1006, Revision 0

Purchase Orders

- Valinox Purchase Order (PO) No. 161-116576, dated April 24, 2014, to SOTEP-CEDEX for steam generator tubes to Alloy 690 ASME Section II, Grade SB 163 - 1995 Edition through 1997 Addenda, Code Case N-474-2 material specification for Doosan Braka-UAE Project on Valinox Order No. VN13020
- PO No. 161-119436, dated January 29, 2014 to Bureau Veritas Laboratories, for calibration services of Charpy Impact Tester to ISO 17025 requirements
- PO No. 162-119138, dated January 13, 2014 to CVMSARL for calibration of Rockwell Hardness Standard 75HRBW to NVLAP requirements
- PO No. 165-116576, dated April 29, 2013, to Measem Metrologic for calibration services of Electric Technometer TACH PHOTO, TACHOPTUITUN, Frequency Counter FREQet1 to COFRAC requirements
- PO No. 166-105534 Amendment 1, dated December 23, 2013 to Outokumpu-VDM for 220 mm Ø billets to Alloy 690, ASME Section II Grade SB 163 (UNS N06690) material specifications for AP1000 XunDapu Unit 2 project on Valinox Order No. VN10033
- PO No. 166-119468 Amendment 2, dated January 31, 2014, to Salzgitter Mannesmann Stainless Tubes (SMST) for 73 mm Ø x11mm thick hot-extruded tubes to ASME Section II, Grade SB 163 (UNS N06690) for Doosan SHIN-KORI Unit 5 & 6 project on Valinox Order No. VN10033
- PO No. 166-119702 Amendment No. 1, dated April 18, 2014, to Aubert & Duval for 220 mm Ø billets to Alloy 690 (UNS N06690) material specification in accordance with RCC-M Edition 2007 Addenda 2008- 2009, ASME 2001-2003 Addenda for EDF Westinghouse Electric Company – Mangiarotti Project RGV-1300-MGR7-Q3
- PO No. 172-121302, dated June 16, 2014, to ZETEC-France for final Eddy-Current Inspection of MIZ80 steam generator tubes for AP1000 XunDapu-China project on Valinox Order No. VN10033
- PO No. 172-114355, dated October 22, 2013 to AOIP-sas calibration service provider of AOIP module to COFRAC requirements, qualified through COFRAC Accreditation

Receipt Inspection Reports

- Surveillance Report (SR) No. 061/124 dated April 24, 2014, for receipt inspection of Alloy 690 (UNS N06690) 220 mm Ø billets on Valinox PO No. 166-118432 Amendment 2, and

METG 102 Revision 5, billets marked P1 to 18T and Heat No. HR275904 traceable to Auburt & Duval

- SR No. 061/124 dated April 24, 2014, for receipt inspection of Alloy 690 (UNS N06690) 220 mm Ø billets on Valinox PO No. 166-118432 Amendment 2, and METG 102 Revision 5, billets marked P1 to 18T and Heat No. HR 275904 traceable to Auburt & Duval
- SR No. 076/123 dated June 12, 2013, for receipt inspection of Alloy 690 (UNS N06690) 220 mm Ø billets on Valinox PO No. 172-116979 Amendment 2 and METG 102 Revision 5, billets marked P1 to 18T and Heat No. HR253003 traceable to Auburt & Duval
- SR No.102/120 dated February 4, 2014, for receipt inspection of Alloy Grade NY690 ASME SB 163 (UNS N06690) 220 mm Ø billets for Doosan Order No. 116300 SHIN KORI Unit 5, billets marked P1 to 18T and Heat No. HR169004 traceable to Auburt & Duval
- SR No.103/120 dated February 4, 2014, for receipt inspection of Alloy grade NY690 ASME SB 163 (UNS N06690) 220 mm Ø billets for Doosan Order No. 116300 SHIN KORI Unit 5, billets marked 12 to 17T and Heat No. HR169101 traceable to Auburt & Duval
- SR No. 104/120 dated February 4, 2014 for receipt inspection of Alloy grade NY690 ASME SB 163 (UNS N06690) 220 mm Ø billets for Doosan Order No. 116300 SHIN KORI Unit 5, billets marked P1 to 18T and Heat No. HR16102 traceable to Auburt & Duval
- Valinox receipt inspection prior to delivery at SMST of hot extruded tube SMST quality lot No. QL30072394, Heat No. HR259802 for UNS N06690 1.2 m length tubes on July 11, 2014

Certified Material Test Reports

- Certified Material Test Reports (CMTRs) for each lot of eighteen 220 mm Ø billets to ASME SB 163, Alloy UNS N06690 material specifications traceable to Auburt & Duval Heat Nos. HR169004, HR 169101, HR169102, HR169103, and HR173502 respectively, accepted to Valinox PO No. 116300 Amendment 3 and METG 102 Revision, 5 dated January 24, 2014
- CMTR for eighteen 220 mm Ø billets to Grade type NY690, alloy UNS N06690 material specifications, traceable to Auburt & Duval Heat No. HR253003, accepted to Valinox PO No. 172-116979, Amendment 2 and METG 102 Revision, 5
- CMTR for sixteen 220 mm Ø billet lot to Grade NY690 NC30Fe alloy UNS N06690 traceable to Auburt & Duval Heat No. HR275904 accepted to Valinox PO No. 166-118432, Amendment 2, RCCM M4105 Edition 2007 Mod. 2008 dated May 20, 2014
- CMTR for eighteen 220 mm Ø billet lot to Grade NY690 NC30Fe alloy UNS N06690 traceable to Auburt & Duval Heat No. HR280504 accepted to Valinox PO No. 166-118432, Amendment 2, RCCM M4105 Edition 2007 Mod. 2008, dated May 20, 2014

Nonconformance Report (NCR) and Corrective Action Request (CAR)

- NCR No.12/054, "Management of regulatory requirements to be improved, audit report," Revision 0, dated August 22, 2012

- NCR No.12/080, "Eddy Current procedure to measure background noise not complying with RCCM," Revision 0, dated December 19, 2012
- NCR No.13/036, "Tubes final Eddy Current controls not assessed correctly by subcontractor Intercontrole," Revision 1, dated December 12, 2013
- NCR No.13/038, "Tubes final Eddy Current controls not assessed correctly by subcontractor Intercontrole," Revision 1, dated November 29, 2013
- NCR No. 14/002, "Noncompliance of a hold point in SMST (supplier of Valinox), during hot extrusion," Revision 2, dated February 11, 2014
- NCR No.14/004, "Temperature exceeded in the heat treatment TIV," Revision 1, dated January 10, 2014
- NCR No. 14/011, "Non-correct position of thermocouples in a tube bundle through heat treatment," Revision 0, dated March 20, 2014
- NCR No. 14/013, "Tube layer treated with 22 tubes instead of 21 at maximum," Revision 0, dated March 26, 2014
- NCR No 14/014, "Roughness not correct," Revision 2, dated April 1, 2014
- NCR No. 14/018, "Tubes final Eddy Current controls not assessed correctly by subcontractor Intercontrole," Revision 0, dated April 8, 2014
- NCR No. 14/019, "Temperature not maintained during heat treatment of a tube layer," Revision 0, dated April 18, 2014
- NCR No.14/022, "Temperature not maintained during heat treatment of a tube layer," Revision 0, dated May 14, 2014
- NCR No.14/023, "Temperature not maintained during heat treatment of a tube layer," Revision 0, dated May 16, 2014
- CAR No. 12/007, "Heat treatment issues," Revision 0, dated April 23, 2012
- CAR No. 14/014, "Wrong assessment of Eddy Current from Intercontrole subcontractor," Revision 1, dated April 9, 2014
- CAR No. 14/034, "Audit reports insufficient quality and delays," Revision 0, dated July 10, 2014

Miscellaneous Documents

- Valinox contract review form No. PAM 031, Annex 02, Revision 00, dated November 3, 2010 for Doosan Heavy Industries Purchase Order (PO) No. 2009033852, Valinox Order No. VN11016

- Valinox Demand for Material form PAM095, Revision 4, Annex 01 Revision 0, for Valinox Order No. VN11016
- Valinox, LDA-605, "List of Document Applicables," Revision 6, dated May 27, 2014 for Valinox Order No. VN11016, Doosan Heavy Industries PO No. 2009033852
- Valinox PQP-146, "APR-1400 Steam Generator Tubing (SHIN KORI 5 & 6) Pre-Production Qualification Program for Alloy 690 (UNS N06690), Revision 2, dated July 25, 2013
- Valinox LPGV-5130, "Steam Generator Tubing in Alloy 690 (UNS N006690) APR-1400 Pre-Production Qualification Report," for Doosan SHIN-KORI Units 5 & 6, Revision 0, dated September 13, 2013
- Valinox L606, "List of Contracted Agreed Suppliers," Revision 20, dated May 28, 2014
- Valinox Packing List for Box 4 of 32 for steam generator tubes for Doosan Heavy PO No. 200933852, SHIN KORI Unit 5B project on Valinox Order No. VN11016 dated July 8, 2014
- Valinox Audit report of Salzgitter Mannesmann Stainless Tubes - Montbard, France dated June 07, 2013
- Valinox Audit report of Aubert & Duval, France, dated July 17, 2012
- Valinox Packaging List dated July 8, 2014 for Box No. 4 of 32 for Steam Generator Tube set 5B for Doosan Heavy Industries PO No. 200933852 for SHIN KORI Unit 5B
- Valinox Final Data package for AREVA Steam Generator GV/ND 396, rev. 00, dated April 29, 2014
- Aubert & Duval M4239, "Manufacturing Plan for 220 mm Ø billets material grade NY690 (NC30Fe) to Valinox METG 102 Revision 5," Revision HI, dated June 29, 2012
- ZETEC Reference Document No. 20130823, "SHIN-KORI Units 5 & 6, Pre-Production Tube Inspection Report," Revision B, dated September 16, 2013
- ZETEC Certificate No. 14/00099, "Eddy Current Examination Certificate Report - U-Bent MIZ81 Steam Generator Tube Bundle GV/ND-396," for AREVA PO No. FE01/107204810, Valinox Order No. VN12001 dated February 20, 2014
- Doosan Document Review Sheet (DRS) for Purchase Specification No. N11008-160DR-5014 for Steam Generator Tubes for Shin Kori Units 5 & 6 project, approval of Valinox request No. BB13-042
- Doosan DRS dated January 21, 2013 for approval of Valinox QP-656 Revision 0, invoking Korea Hydro & Nuclear Power witness/hold points
- Doosan DRS dated May 27, 2014, for approval of Valinox QP-656, Revision 4 and packaging procedure EMB-264, for Doosan PO No. 2009033852, Valinox Order No. VN11016
- Valinox Fabrication Order VN13004 – "SENPEC SG Tubes," dated April 06, 2014

- Gamme de Fabrication, (Mother Tubes) Revision 1, dated November 11, 2014
- Gamme de Fabrication, (Tubes for the set), Revision 1, dated November 4, 2014
- Referentiel Plan de Serviellance, "Grenailage,a l'APN2", Revision 0 dated June 26, 2012
- Referentiel Plan de Serviellance, "Four Driver APN2," Revision 0, dated May 31, 2012
- Animation Qualite Hebdomadire, "Bilan de la semaine 201425 BQ2014W25," Revision 0
- Procedure Interne D Etalonnage , REF ETA111, "Verification Periodique Des Appareils A Ultrasons Et Courants De Foucault," Revision 6, dated May 7, 2013
- Qualification De La Procedure US 344 "C9152 Bench parametric setup," Revision 0
- Qualification De La Procedure CF 265, "C9152 Bench parametric setup," Revision 0
- ETA 111, "Verification d'un appareil de controle santé par US, – UT C9152 Bench Vertical Linearity Calibration," Revision 6, Annexe. 4, dated June 24, 2014
- ETA 111, "Verification d'un appareil de controle santé par CF, - Eddy Current C9152 Bench Calibration," Revision 6, Annexe. 6, dated March 26, 2014
- ETA 111, "Verification de la Vitesse de Rotation Des Tetes Tournantes Et Vitesse D'Avane," Revision 6, Annexe. 7, dated March 26, 2014
- Rapport De Controle, "ETALON CF n TGL 980," dated March 7, 2013
- Carte De Controle par Attribut, Week dated May 24, 2014
- CF265, "Dongfang Electric Corporation Volumetric Soundness – Absence of ID Carbonization and/ or Pollution Eddy Current Examination," Revision 0, dated March 25, 2014
- US344, "Dongfang Electric Corporation Volumetric Soundness OD/With Ultrasonic Evaluation," Revision 00, March 25, 2014
- NPS-XDP-SG00, "Dongfang Technical specification," Revision B, July 11, 2013
- Excel table, Follow-up of nonconformance reports, dated July 8, 2014
- Excel table, Quality alert follow-up table, dated July 8, 2014
- Excel table, internal audits schedule on the quality system 2012, Revision 0, dated July 8, 2014
- Excel table, internal audits schedule on the quality system 2013, Revision 0, dated July 8, 2014
- Excel table, internal audits schedule on the quality system 2014, Revision 0, dated July 8, 2014

- Excel table, internal audits schedule on the quality system 2014, Revision 1, dated July 8, 2014
- Excel table, internal audits schedule on the quality system 2014, Revision 2, dated July 8, 2014
- Internal audit report on PAM 170, audit report 3A and 3B, Revision 0, dated February 24, 2014
- Auditor qualification Excel file, PAM 184 annex 01
- Internal audit report No. 6, "Purchase and external inspections process," Revision 0, dated December 6, 2013
- Internal audit report No. 6, "Purchase and external inspections process," Revision 0, dated June 27, 2014
- Management Review 2013 Report, dated February 20, 2014
- Records for Vacuum-Treatment for Shin-Kori 5 Contract Numbers. 14088, 14051, 14065, 14052
- E-mail from UAP2 Team Leader to all TIV operators, dated March 20, 2014

6. ACRONYMS USED:

ADAMS	Agencywide Documents Access and Management System
ASN	L'Autorité de sûreté nucléaire
ASNT	American Society of Nondestructive Testing
CAR	Corrective Action Request
CFR	<i>Code of Federal Regulations</i>
CSFI	Counterfeit, Fraudulent or suspect Items
DCIP	Division of Construction Inspection and Operational Programs
ECT	eddy-current test
EPRI	Electric Power Research Institute
EVIB	Electrical Vendor Inspection Branch
IP	inspection procedure
IR	issue report
KHNP	Korea Hydro & Nuclear Power
MDEP	Multinational Design Evaluation Program
M&TE	measuring and test equipment
NDE	non-destructive examination
NON	Notice of Nonconformance
NRC	(U.S.) Nuclear Regulatory Commission
NRO	Office of New Reactors
ONR	Office for Nuclear Regulation
PAM	Procédure d'Application du Manuel
PO	purchase order
QA	quality assurance

QM	quality management
RPC	Products and Contracts Manager
RGVL	Responsible Products Line Manager
SG	steam generator
U.S.	United States (of America)
UT	ultrasonic test
Valinox	Valinox Nucléaire
VICWG	Vendor Inspection Cooperation Working Group