



Nuclear Power Plant KRŠKO

TO.VZISI

TECHNICAL SPECIFICATION

No. TS ISI-12/24

for

NPP Krško Steam Generators Secondary Side Visual inspection in Outage 2025

(EBS IN 8241910)

Revision 0

Safety Related

Prepared by:

L. Pušnik
L. Pušnik - ISI engineer

Date: 26 / 8 / 2024

Reviewed by:

A. Vučajnik
A. Vučajnik - Leading ISI engineer

Date: 26 / 08 / 2024

Reviewed by:

A. Kapetanović
A. Kapetanović - QA Engineer

Date: 26 / 08 / 2024

Approved by:

M. Habinc
M. Habinc - Maintenance manager

Date: 26 / 08 / 2024

Approved by:

M. Gluhak
M. Gluhak - Technical director

Date: 26 / 08 / 2024

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1.0 ACTIVITY

This Technical Specification defines requirements related to the performance and scope of the Steam Generator (SG) Secondary Side Visual Inspection (VT) during outage 2025. Bidder is therefore expected to submit a proposal for service under the terms prescribed in this Technical Specification.

2.0 SCOPE

Bidder shall submit the technical proposal for the SG Secondary Side VT - Visual Inspection which shall include at least the following areas on both (SG 1&2) NPP Krško Steam Generators:

- 1) Shroud to Shell centering inspection including welded joints
- 2) J-Nozzle Feed-Water (FW) ring including ring holders, welded joints and others structural elements in that particular area.
- 3) Auxiliary Feed-Water (AF) nozzle, compensator and pipe welded restraint. Replaced AF distributor should be inspected as well as shell wall surrounding surfaces to confirm that cold water did not affected shell wall,
- 4) Top of the tube bundle inspection including Anti Vibration Bars, Nodes, accessible shroud to shell support structures and other structural elements at this SG elevation
- 5) 1st stage Moisture Separators, 2nd stage Moisture Separators drain system pipe assembly (dryer system down pipes and supports) and others structural elements above steam separator deck plate
- 6) Wet-lay up nozzle (not in operation)

Scope of service includes time for supplier personnel site specific and HP training, transportation, preparation, equipment set up, inspection, eventual loose part retrieval, equipment tear down and preparation of preliminary and final report. Within the scope supplier shall provide personnel, tools and applicable procedures for disassembling and assembling of inspection cover at Steam Separators deck-plate to access top of the tube bundle.

Bidder Technical proposal shall also address personnel, equipment, consumables, qualified procedures, necessary tooling & services and FME (Foreign Materials Exclusion procedure for control & retrieval equipment).

3.0 SAFETY CLASIFICATION

SG Secondary Side VT-Visual Inspection is considered a Safety Related (SR) activity.

4.0 TYPE OF SERVICE

According to internal NPP Krško classification, SG Secondary Side VT Inspection is considered as type of service with fixed price for defined scope / activity which shall be implemented in accordance with supplier's QA Program accepted by the NEK and includes supplier's QA/QC surveillance. Supplier shall fulfill requirements listed in Item 13.0.

5.0 APPLICABLE CODES, STANDARDS AND PROCEDURES

- 5.1 ASME B&PV Code Section XI, Edition 2017
- 5.2 ASME B&PV Code Section V, Edition 2017 - Article 9
- 5.3 NEI 97/06 (Rev. 3, Jan. 2011)
- 5.4 TR-1013706; SGMP PWR SG Examination Guidelines: Rev. 8
- 5.5 TR1012987; SG Integrity Assessment Guidelines; Rev. 2
- 5.6 NEER-G/2008/en/0100 Rev. A RSG Krško SG 72 W/D4-2 Maintenance Manual
- 5.7 KTA 3201.4; (2010-11)
- 5.8 ANSI/ASNT CP-189; 2006
- 5.9 TD-0H; Program uparjalnikov (NEK Steam Generators Program) Rev.5

6.0 IDENTIFICATION OF AFFECTED EQUIPMENT

NPP Krško Steam Generators SG#1 and SG#2 with internal NEK / MECL nomination: RCPCSGN1 & RCPCSGN2.

7.0 TECHNICAL / INSPECTION REQUIREMENTS / EQUIPMENT

All Steam Generator Secondary Side VT – Visual inspection by remote system activities shall be performed in accordance with procedures prepared by a supplier. Remote controlled video system shall fulfill requirements from ASME XI (ref. 5.1, 5.2) and shall be able to perform VT-1 and VT-3 Examination.

Definition of potentially **RELEVANT CONDITIONS** to be found and shall be reported:

Foreign parts, physical displacement, loss of integrity at bolted or welded connections, loose or missing parts, debris, and conditions that could affect operability or functional adequacy of structural elements (VT-3) as well as discontinuities and imperfections on the surfaces including such conditions as cracks, wear, corrosion, and erosion (VT-1).

Note: SG SECONDARY MANWAYS (both two) will be open to provide access for remote video system and personnel to the moisture separator area.

Prior to the VT inspection, opening in the steam separator deck plate - to access top of the tube bundle - shall be removed by the supplier disassembling/assembling team. All preparation activities inside SG will be monitored by the NPP Krško personnel (ISI-representative) to provide and monitor all FME principles and requirements, which will be fully filed.

Supplier shall be able to provide acceptance criteria based on the Design basis of NPP Krško Replacement Steam Generators model SG 72 W/D4-2. If RELEVANT indications are discovered, the supplier shall be able to provide JCO (Justification for Continuous Operation) or OCJ (One Cycle Justification). Supplier shall provide the letter of intent from Original Equipment Manufacturer (Siemens/Framatome) that OEM will provide him all necessary Design inputs and analysis data needed for eventual JCO or OCJ. A letter of intent shall be handed over within the proposal.

Supplier shall provide a set of bolting material for each 1st stage moisture separator re-installation after the inspection activities and a reserve set of bolting for each 1st stage moisture separator if additional re-installation is needed due to any reason.

8.0 QUALIFICATION REQUIREMENTS

Inspection personnel shall be trained qualified and certified as a VT (Visual testing) level II in accordance with the ANSI/ASNT CP-189, ASNT Standard for Qualification and Certification of Non Destructive Testing Personnel, 2006 Edition or later (Ref. 5.8).

The indirect VT (Visual Testing) technique shall be performed per requirements from 7.0 and general requirements from ASME B&PV Code Section V and XI (Ref. 5.1, 5.2, 5.3, 5.7, 5.8).

All supplier procedures shall be approved by its leading VT analyst who shall possess a valid **ASNT NDT level III certificate** for VT method.

In addition, Inspection personnel shall pass obligatory site-specific trainings and tests before entering the controlled area. Supplier disassembling / assembling team shall pass additional indoctrination about FME site specific procedures. Also, personnel shall have valid medical exam and updated radiological exposure reports. Before entering the control area, each person shall perform a Whole-Body Count (WBC) measurement at the NPP Krško site.

Personnel shall have at least two (2) references of Secondary side VT inspection on the SG type similar to model SG 72 W/D4-2. (I 690 TT ¾" tubing, triangular pitch, lattice bars supports, baffle plate and Siemens design tube bend supports (AVB)). Reference is also required for dismounting of 1st stage triple Moisture Separators cover, which is needed to access tube bundle at the U-bend.

9.0 DETAIL SCHEDULE

According to the present plan for outage 2025, the start of SG Secondary Side by remote VT-Visual Inspection activity **on SG secondary side Manway platform location** is scheduled as follows:

SG#1: 12. Oct. 19:00 - 14. Oct. 01:00 (30 hrs)

SG#2: 14. Oct. 04:00 - 15. Oct. 10:00 (30 hrs)

Supplier shall prepare detailed time schedule for the whole activity including preparation time outside reactor building, equipment set-up, disassembling / assembling cover with Moisture Separators opening at MS deck VT inspection, tear down and hand-carried transport through personnel hatch: Attachment 1.

All equipment shall be hand carried. Polar crane will be available only for limited period of time prior and after the inspection time window for lifting equipment from Reactor Building elevation 115 to the SG platforms.

Actual start of VT inspection will be notified to supplier by NPP Krško representative app 1 month before the outage 2025 starts. Check-in date of supplier personnel will be mutually agreed.

10.0 SUPPLIER RESPONSIBILITIES

Supplier shall provide to NPP Krško:

- Preparation of all documentation necessary for scope prescribed in 2.0 and by the requirements listed in this technical specification.
- Inspection equipment and consumables capable of fulfilling the scope given in Section 7.0.
- Trained, qualified, and certified inspection personnel as required in Section 8.0.
- All working procedures shall be handed over to the NPP Krško for review and comment.
- QA/QC coverage of inspection activities.
- Completion of required scope within available time.
- Reports of performed activity (Preliminary and Final report). All reports shall be handed over to NPP Krško representative for review and comment.
- Proposal shall address FME procedure used during inspection activities.
- The Bidder shall provide at least two (2) confirmed references of SG Secondary Side VT inspection in PWR NPP-s with similar design as model SG 72 WD4-2 (I 690 TT ¾" tubing, triangular pitch, lattice bars supports, baffle plate and Siemens design tube bend supports (AVB).

Working procedures and FME procedure shall be handed over in the bidder proposal. Procedures will be subject of technical evaluation to confirm if requirements from this Technical Specification are fulfilled. This Evaluation is considered as bidding pre-condition.

After awarding the contract and 30 days prior to beginning of service, Documentation shall be handed over (or send by e-mail) for review and comment. If these documents were already handed-over, vendor shall send a list of applicable procedures (title, date of issue, revision) to be used. As minimum, documentation shall contain:

- a) Organization chart for the activity to be performed including responsibilities of personnel;
- b) QA/QC plan where NEK and authorized inspection organizations will define check points (R, W, H, T);
- c) List of applicable procedures (latest revision) and controlled copy of that procedures;
- d) Personnel qualification certificates;
- e) Equipment and material list with all calibration certificates if applicable (MTE equipment).

After work is performed or latest on the exit meeting, Supplier shall prepare Preliminary report about activities performed which includes as a minimum:

- a) Overview of the scope performed;
- b) List of non-conformities with their status;
- c) Qualitatively judgment of the work performed;

At least 30 days after the completed scope of work, Supplier shall deliver the Final Report (3 copies), which includes as a minimum:

- a) Overview of the scope performed;
- b) List of non-conformities with their status;
- c) List of all applied work and control procedures;
- d) List of all personnel and their certificates;
- e) Equipment and material list with all calibration certificates if applicable;
- f) All QA reports;

- g) All pages in the Final report shall be numbered and Total pages number shall be noted on the front page of the Final Report.
- h) Final Report in the .pdf format and Video recordings stored on a portable disk drive connectable to a computer via the USB.

11.0 NEK RESPONSIBILITIES

NPP Krško shall provide the following:

- Connection of all electrical power needs for supplier (normally 230V 16A 50 Hz).
- Supply clean/dry plant air (Compressed Air from CA system) at 7 bars.
- Sufficient clearance and scaffolding for the inspection team to access the SG platforms at inspection openings and secondary manway elevation.
- Lay-down area for VT equipment on the RB elevation 115.
- All applicable as-built drawings of NPP Krško replacement SGs are available on site.
- ISI representative will provide interpretation, organization, and necessary implementation of NPP Krško Field Service Site Specific Applicable Procedures.
- Support for on-site transportation and lifting.
- Site-specific training courses needed for entering the control area (2-3 days before actual start of the activity in the Reactor building).
- HP coverage and support for decontamination – if needed.
- Office outside the technological part of the power plant for workers for the duration of the activity.

12.0 SPECIAL REQUIREMENTS

During Steam Generator Secondary Side VT – Visual inspection activity all requirements from NPP Krško Site specific procedure **ADP-1.1.101 Foreign Material Exclusion** shall be fulfilled. Suppliers Inspection personnel shall prepare list of items (equipment and tools) entering Secondary Side manway and inspection ports which will be checked before entrance and after withdrawal from SG secondary side area in the presence of NPP Krško person (ISI-representative).

13.0 QA REQUIREMENTS

For the supply of Safety Related (SR) products and services, the Supplier shall establish a quality assurance (QA) Program that complies with the requirements of Title 10, Code of Federal Regulations, Part 50, Appendix B (10CFR50, Appendix B), Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants, the standard of ANSI/ASME N45.2-1977, Quality Assurance Program Requirements for Nuclear Facilities or ASME NQA-1-2008, Addendum 2009/2011, Quality Assurance Requirements for Nuclear Facility Applications and the requirements of the enclosed specification QS-610, Rev. 2, Generic Quality Assurance Program Requirements.

Any noncompliance and defects shall be reported in compliance with the requirements of Title 10, Code of Federal Regulations, Part 21 (10CFR21), Reporting of Defects and Noncompliance.

The Supplier's bid shall be accompanied by the QA Manual of the latest revision, if not previously submitted to NEK. The relevance and effectiveness of the Supplier's QA Program shall be reviewed and accepted by NEK prior to the contract award. The same shall apply to any subsequent changes proposed by the Supplier during the implementation of the purchase order.

All work shall be carried out in compliance with the Supplier's QA Program and with the previously approved QA/QC Plan. In accordance with this specification, the Supplier shall also assume responsibility to require any Subcontractors to comply with the quality requirements, technical and commercial requirements, and schedules, in accordance with this specification.

Applicable Codes and Standards:

- 10 CFR 50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
- 10 CFR 21, Reporting of Defects and Noncompliance
- ANSI/ASME NQA-1-2008, Addenda 2009/2011, Quality Assurance Requirements for Nuclear Facility Applications

14.0 APPENDICES

Attachments:

Att. 1: Time Schedule for Outage 2025

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Activity ID	Activity Name	Original Duration	Finish	Interlog	Description	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Project: RE2025 - Upravljanje aktivnostima planiranih za RE25																			
0000	TRAJANJE REMONTA (kao ier 10 breakeri)	600h	28-Sep-25 02:00																
0001	Zaselek SD laza H9	0h	05-Oct-25 04:00																
0002	Održavanje, pregled zaslona RB (Emergency Air Lock) u lazi H9	3h	05-Oct-25 04:00																
0003	SL, FOSAR, IBL (er SL po IBL-u na SZ2)	200h	05-Oct-25 07:00																
0004	SL, FOSAR, IBL (er SL po IBL-u na SZ2)	160h	05-Oct-25 14:00																
0005	Zaustavljanje SZ1 inspekcijom odgorn	0h	12-Oct-25 08:00																
0006	Održavanje osamljive pred polnjenjem SZ1 iz AF epialo 1A	1h	12-Oct-25 14:00																
0007	Polnjenje sekundarne strani SZ1 do nivoa 20% WR (za potrebe zpranja) z AF epialo 1A -	1h	12-Oct-25 15:00																
0008	VI odvozi odg. kumila o polnjenje sekundarne strani SZ1	0h	12-Oct-25 16:00																
0009	Denniranje SZ1 do 0% WR pred ponovnim polnjenjem za inspekciju sek. strani	1h	12-Oct-25 16:00																
0010	Polnjenje sekundarne strani SZ1 za inspekciju (80% NR) z AF epialo 1A - sek. vhod odg.	2h	12-Oct-25 17:00																
0011	Dug VT Oprema z RB-115 k malway-u sek. strani SZ1	1h	12-Oct-25 18:00																
0012	Inspekcija sekundarne strani SZ1 (na 10 m)	30h	12-Oct-25 19:00																
0013	Zaustavljanje SZ2 inspekcijom odgorn	0h	13-Oct-25 17:00																
0014	Održavanje osamljive pred polnjenjem SZ2 iz AF epialo 1A	1h	13-Oct-25 23:00																
0015	Polnjenje sekundarne strani SZ2 do nivoa 20% WR (za potrebe zpranja) z AF epialo 1A -	1h	14-Oct-25 00:00																
0016	VI odvozi odg. kumila o polnjenje sekundarne strani SZ2	0h	14-Oct-25 01:00																
0017	Denniranje SZ2 do 0% WR pred ponovnim polnjenjem za inspekciju sek. strani	1h	14-Oct-25 01:00																
0018	Dug prenos VT opreme od SZ1 k malway-u sek. strani SZ2	1h	14-Oct-25 02:00																
0019	Polnjenje sekundarne strani SZ2 za inspekciju (80% NR) z AF epialo 1A - sek. vhod odg.	2h	14-Oct-25 02:00																
0020	Inspekcija sekundarne strani SZ2 (na 10 m)	30h	14-Oct-25 04:00																
0021	Sputa VT opreme od SZ2 nazaj na RB-115	1h	15-Oct-25 10:00																
0022	Zaustavljanje SZ2 sekundarnoga vhoda (PC na voljo)	0h	15-Oct-25 11:00																
0023	Konac SD laza H9	0h	15-Oct-25 17:00																

Remaining Work

Critical Remaining Work

Actual Work

▲ Milestone

▲ Krt. Milestone

▲ Act. Milestone

Stran: 1 od 1
RE25 - V1-PREGLED PLANA (SD laza H9)
Datum upisa: 01. Avg. 24. u 11:44

RE2025 - Upravljanje aktivnostima planiranih za RE25
10-todinska inspekcija sekundarne strani SZ1 u RE25

RE2025 - Upravljanje aktivnostima planiranih za RE2025
10-tedna inspekcija sekundarne strani SZ1 v RE2025

Stran: 1 od 1
RE2025 - Upravljanje aktivnostima planiranih za RE2025
Datum tiskanja: Aug 21, 2024

Legend:
Remaining Work
Critical Remaining Work
Actual Work
Milestone
Krit. Milestone
Act. Milestone