

NUCLEAR POWER PLANT KRŠKO

TECHNICAL DIVISION
PRODUCTION DEPARTMENT (TO.PR)



TECHNICAL SPECIFICATION FOR SERVICE SLUDGE LANCING, INNER BUNDLE LANCING AND REMOTE VISUAL INSPECTION OF STEAM GENERATORS

(IN 8170878)

Revision 0

CLASSIFICATION: SR (Safety Related)

Prepared by: 
(R. Kelavić – System Engineer)

Date: 7/4/17

Reviewed by: 
(G. Pfeifer – Production Manager)

Date: 12/04/2017

Reviewed by: 
(R. Bižčan - QA Engineer)

Date: 13/04/2017

Approved by: 
(P. Širola – Technical Director)

Date: 19/4/2017

CONTENTS

- 1. Activity**
- 2. Scope of Service**
- 3. Safety Classification**
- 4. Service Type**
- 5. Codes, Standards and Procedures**
- 6. Identification of Equipment**
- 7. Technical Requirements**
- 8. Qualification Requirements**
- 9. Detailed Schedule**
- 10. Contractor Responsibilities**
- 11. NEK Responsibilities**
- 12. Special Requirements**
- 13. QA Requirements**
- 14. Abbreviations**
- 15. Attachments**

1. Activity

The basic scope of activity includes the performance of sludge lancing (SL) on SG1 & SG2, inner bundle lancing (IBL) of the tubesheet of secondary side of NEK steam generator two (SG2) and 100% remote visual inspection (RVI) of both tubesheets (SG1 & SG2). The activities shall be performed on both steam generators during regular refueling outage in April 2018.

2. Scope of service

Scope of service includes sludge lancing on secondary side of NEK steam generators (RCPCSGN1 and RCPCSGN2), inner bundle lancing only on SG2 and 100% remote visual inspection of both SG's tubesheets during regular plant outage 2018.

Contractor shall:

- 2.1 Provide proven and qualified equipment needed for sludge lancing and inner bundle lancing at NEK steam generators Type 72W/D4-2 - triangular pitch 3/4" tube diameter.
- 2.2 Test the equipment for sludge lancing and inner bundle lancing of NEK steam generators before usage at NEK and provide assurance that steam generator cleaning methods have no detrimental effect to the steam generators, especially to the integrity of steam generator tubes. Test shall show that equipment can be inserted into the steam generator (available space from the handhole flange to the closest object – walls and available space in no-tube lane) and withdrawn at the end of operation without any detrimental effects to SG tubes. Test shall also show the efficiency of the cleaning.
- 2.3 Perform the following activities necessary for lancing and inspection of both SG's which include:
 - transport of the equipment and crew, to and from site,
 - set-up of the equipment,
 - operation of all equipment,
 - FOSAR activity
 - changing of filters,
 - sludge weighing,
 - disassembly of equipment.
- 2.4 Provide all necessary equipment and consumables for the sludge lancing and inner bundle lancing activities including filters, resin filter loads, vinyl sleeving for flexible pipes protection, etc. For consumables which will enter the Reactor Building provide certificates about physical and chemical characteristics.

- 2.5 Provide all necessary equipment and consumables needed for performing remote visual inspection of the tubesheet on secondary side of both NEK steam generators. Provide statement that remote visual inspection activity and foreign material removal method has no detrimental effect to the steam generators, especially to the integrity of steam generator tubes.
- 2.6 Provide cleaning equipment with main parts (high pressure pump, water reservoir, water filter etc.) to be installed outside Reactor Building and remote control station to be installed inside Reactor Building. Remote control station shall be such dimensions and weight that could be transferred manually to Reactor Building through Personal Airlock.
- 2.7 Provide adequate tools to extract foreign object if found in steam generators. Decision of using tools to extract foreign object will be made after adequate analyses by the contractor. The decision for extraction will be made by NEK coordinator (WP).
- 2.8 Provide tools for cleaning the possible dry sludge from 'No-tube lane' area and gutter in the peripheral lanes of SG's tubesheet. Criterion for cleanliness in the peripheral lanes is that all sludge shall be removed. Conformation of cleanliness in 'No-tube lane' area and the peripheral lanes shall be made by NEK coordinator (WP).
- 2.9 All service activities on site shall be completed in time schedule (details in item 9).
- 2.10 Preliminary Report on performed services in the outage shall be submitted by the Contractor in (2) two original copies at the final meeting before leaving the plant. The Final Close-out Report in (3) three original copies and one PDF version (USB stick or by e-mail) shall be submitted to NEK 30 days after receiving the comments of Preliminary Report but no less than 60 days after the final meeting.

3. Safety Classification

Steam Generator Sludge Lancing Service is classified as SAFETY RELATED (SR).

4. Service type

Service activities shall be performed for fixed price for specified scope of service. Service is performed in accordance with contractor's QA plan/program and working procedures. The supervision and coordination of work will be carried out by NEK's coordinator from Production Department (TO.PR).

5. Codes, Standards and Procedures

- 10CFR50, Appendix B Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
- 10CFR21, Reporting of Defects and Noncompliance
- ASNT CP-189, Standard for Qualification and Certification of Nondestructive Testing Personnel
- ASME Section V, Nondestructive Examination; Visual Examination
- ASME Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components
- ASME NQA-1, 2008 Quality Assurance Requirements for Nuclear Facility Applications
Add. 2009/2011
- EPRI TR 1020989 SGMP: Foreign Object Prioritization for Triangular Pitch SG

5.1 Prior to the start of the work the Contractor shall get knowledge on NEK's internal rules for working inside the controlled area. The topics they have to understand are:

- Foreign Material Exclusion – FME program
- Industrial Safety at NEK
- Entrance and movement in technological area of NEK
- Access of subcontractors to NEK
- Fire protection program
- ALARA radiological protection program
- Protection of nearly systems, structures and components
- 10CFR21 Reporting of Defects and Noncompliance

6. Identification of Equipment

All activities shall involve sludge lancing inner bundle lancing and remote visual inspection of the tubesheets within RCPCSGN1 and RCPCSGN2 NEK steam generators.

7. Technical Requirements

All services should not produce any foreign material. Approved equipment shall be used for services at NEK.

Sludge removal during sludge lancing and inner bundle lancing service shall be done through two inspection ports.

Before remote visual inspection start, steam generator tubesheet must be dried with drying system (contractor can use NEK drying equipment or shall provide his own). Contractor's personnel shall be familiar how to use drying equipment. Drying system has to be connected to a filtration unit. Verification of drying system effectiveness shall be demonstrated to NEK (WP).

Remote visual inspection through inspection ports should verify cleanliness of the whole tubesheet. With the results of remote visual inspection, contractor shall provide comparison between scope of hard sludge area from 2015, 2016 and 2018. Data of hard sludge area from previous years shall be provided by NEK. Mapping of hard sludge area shall be identified according to NEK provided layouts of SG's tubesheet.

In case when eventual "foreign material" is found in SG's, it shall be analyzed, measured, classified accordingly to 'EPRI TR 1020989 SGMP: Foreign Object Prioritization for Triangular Pitch SG' and try to remove with adequate tools. Location of foreign objects shall be identified according to NEK provided layouts of SG's tubesheet.

Possible residual dry sludge in 'No-tube lane' area and in the gutter of the peripheral lanes of tubesheet should be cleaned or vacuumed with adequate tool.

Equipment, tools and auxiliary equipment used during performance of the scope of this specification shall not have any detrimental effect to the steam generator, especially to the integrity of steam generator tubes.

8. Qualification Requirements

Contractor's personnel performing sludge lancing and inner bundle lancing activities should be qualified and experienced in sludge lancing and inner bundle lancing work activities. Preferably, some should have experience with sludge removal activities at NEK.

Contractor's personnel performing remote visual inspection shall be qualified and certified in accordance with ASNT CP-189 Standard for Qualification and Certification of Nondestructive testing Personnel (min. NDE level II).

All contractor's personnel should have good command in English language. Workers must submit evidence on a good command of written and spoken English if English is not their first language.

Qualification of sludge removal activities shall be performed to demonstrate that cleaning methods have no detrimental effect on the integrity of Steam Generators tubes. Qualification shall be applied to meet NEK steam generators requirements (Type 72W/D4-2 triangular pitch, Inconel 690TT tube material, and 3/4" tube diameter). Qualification report shall be in English language or shall be officially translated into English language.

Software shall be applied to meet requirements of ASME NQA-1, Part II, Subpart 2.7, if software application could cause detrimental impact on steam generators internals.

Contractor shall provide relevant documentation for granting access to NEK for contractor's personnel at least 90 days ahead of the anticipated start of outage. Personnel qualifications and certificates for job performance together with health reports should be supplied to NEK procurement department. Before start of sludge removal activity (typically day before), contractor's personnel is required to pass a General employee training at NEK.

9. Detailed Schedule

The sludge lancing and remote visual inspection activities shall be performed during the refueling outage in April 2018 (from 5.4.2018 until 17.4.2018). Contactor will be notified of exact dates one month before outage start. Contractor should be able to perform activities according to the following schedule:

• access formalities	16 hrs
• equipment set-up (outside and inside RB – not connected)	24 hrs
• enter the equipment for SL on SG1	6 hrs
• sludge lancing on SG1	27 hrs
• tubesheet drying of SG1	10 hrs
• remote visual inspection of SG1 (+hard sludge mapping)	16 hrs
• FOSAR (foreign object search and retrieval)	4 hrs
• shifting equipment	6 hrs
• sludge lancing on SG2	16 hrs
• tubesheet drying of SG2	10 hrs
• remote visual inspection of SG2*	16 hrs
• inner bundle lancing on SG2	80 hrs*
• sludge lancing after IBL (tubesheet rinsing) on SG2	18 hrs
• final tubesheet drying of SG2	10 hrs
• quick remote visual inspection of SG2	14 hrs
• FOSAR (foreign object search and retrieval)	4 hrs
• equipment disassembly inside RB	12 hrs
• equipment disassembly outside RB	24 hrs
• departure formalities	24 hrs
* - time range is depending of hard sludge mapping and accessibility of workplace around SG2 due to parallel work activities on RCP#2 in the same cubicle performed by others	

10. Contractor Responsibilities

- 10.1 Preparation for sludge lancing, inner bundle lancing (SG2) and remote visual inspection of tubesheets of NEK Steam Generators. Equipment shall be of proper cleanliness before use at NPP Krško. Flushing of hoses and system procedure shall be prepared, approved and implemented. Contractor's chemistry department shall verify equipment cleanliness at home base during preparation. No traces of equipment contamination shall be present. Report of these preparation activities should be sent to NEK prior of equipment arrival at NEK.

- 10.2 All contractors equipment shall be functionally tested prior entering the facility at Krško. Test shall show that equipment for sludge removal can be inserted into the steam generator (available space from the handhole flange to the closest object – walls and available space in no-tube lane) and withdrawn at the end of operation without any detrimental effects to SG tubes and without any foreign objects left. Test shall also show the efficiency of the cleaning method.
- 10.3 If any problems occur during installation (calibration) or start-up of equipment for sludge lancing, inner bundle lancing or remote visual inspection the qualified contractor's personnel must have adequate and quick solution for resolving the problem. All important equipment shall have adequate reserve for fast changing in case of problems.
- 10.4 Contractor shall provide statement that steam generator cleaning method and 100% remote visual inspection has no detrimental effect to the steam generators and especially to the integrity of steam generator tubes and can not produce any foreign objects inside steam generators.
- 10.5 Sludge Lancing, inner bundle lancing (only SG2) and remote visual inspection is to be performed on top of tubesheet on secondary sides of both NEK steam generators, and includes:
- transport of the equipment and crew, to and from site,
 - set-up of the equipment,
 - enter of equipment in the reactor building
 - operation of sludge removal equipment,
 - perform hard sludge mapping and comparison to previous outages,
 - operation of remote visual inspection equipment,
 - FOSAR activities,
 - sludge weighing and filter change,
 - disassembly of the equipment.
- 10.6 Contractor shall have his own procedures for performing sludge lancing, inner bundle lancing service activities and remote visual inspection (with FOSAR) of tubesheets. All work shall be done in accordance with the Contractor's QA program requirements. Contractor's procedures shall be approved by NEK. Procedures shall be provided to NEK at least 60 days prior to the start of outage on April 1st 2018.
- 10.7 The contractor shall provide all necessary equipment and spare parts for the sludge lancing, inner bundle lancing and remote visual inspection activities. All equipment which will be used in radiological controlled area must be appropriately protected from radiological contamination by contractor. All hoses which will be used in reactor building have to be sleeved with colored vinyl sleeving provided by the contractor. Used filters from sludge lancing will be retained by NEK. All other contaminated equipment will not be retained by NEK and shall be taken care of and shipped along with other equipment by the supplier.

- 10.8 Contractor shall prepare FOSAR (Foreign Object Search and Retrieval) tool for foreign object removal, simulate condition and situation to train personnel on mock up prior on-site arrival.
- 10.9 In agreement with NEK contractor can use NEK equipment for drying SG tubesheets. Contractor's personnel shall be familiar and perform functional testing of drying equipment which will be demonstrated to NEK coordinator.
- 10.10 Provide all necessary equipment for establishing conditions for remote visual inspection (drying of SG tubesheets) and equipment for performance of remote visual inspection. Provide adequate method and tools for cleaning or vacuuming the dry sludge from NO-Tube lane and from the gutter in the peripheral lanes of tubesheet. Contractor shall provide requirements for air supply (pressure demands, flow capacity, air quality,...) for equipment **one month before outage start**. NEK uses Express connectors for air supply.
- 10.11 Contractor shall promptly report to NEK coordinator (**within 1/2 hour**) any deviation or nonconformance when performing sludge lancing, inner bundle lancing and remote visual inspection activities.
- 10.12 The Contractor shall present references in regard to sludge lancing, inner bundle lancing and remote visual inspection performance at other plants.
- 10.13 Contractor shall start with foreign object retrieval after NEK approval of retrieval method.
- 10.14 Contractor's personnel performing sludge removal activities shall be trained and experienced to perform sludge removal of NPP Krško model 72W/D4-2 Steam Generator.
- 10.15 Contractor's personnel performing nondestructive examinations (remote visual inspection) shall be qualified and certified in accordance with ASNT CP-189 Standard for Qualification and Certification of Nondestructive testing Personnel (min. NDE level II) to meet NEK's requirements and conditions.
- 10.16 The contractor shall obtain any Slovenian labor permit or any other Slovenian authorization required by Slovenian authorities to allow Contractors personnel to perform the contracted services.
- 10.17 Contractor shall submit to NEK all necessary personnel data for access formalities at **least 90 days** before arrival of contractor's personnel to NEK.

- 10.18 Contractor shall submit to NEK all necessary work certificates, equipment certificates, M&TE certificates, training certificates, complete quality/inspection plan, etc. prior to arrival.
- 10.19 Contractor's personnel who will perform services in Radiological Controlled zone shall be qualified for such work and shall have appropriate documentation (Health Certificate/Dose Certificates, Personal Qualification Records, etc). The Contractor is welcomed to have own HP responsible technician on site during the performance of sludge removal activities.
- 10.20 Status reporting requirements
- 10.20.1 The contractor shall provide brief daily written status reports for the performed work, containing all information regarding the job. In daily report shall be written the status of completed tasks including percent of completeness, problems that have occurred from the last meeting with stated delays and presented plan for the next day, QA/QC issues etc. These reports shall be included in Preliminary and Final report.
- 10.20.2 A Preliminary Report shall be written upon the service completion and given to NEK at the Exit meeting. Preliminary Report shall include as minimum: performed tasks (scope of work), list of applicable documents, nonconformance and deviation reports (if any), corrections of applicable documents, technical improvements, remote visual inspection analysis report, found foreign objects in SG's, sludge removal report, comparison of hard sludge area regarding previous data, recommendation of sludge removal techniques for the future, completed and filled out quality/inspection plan, organization chart and a punch list of any obligations not fulfilled with anticipated dates of corrective actions, analysis of equipment status trends and recommendations, internal audits summary.
- 10.20.3 Detailed Job Close-out Report shall be prepared and sent to NEK **max. 30 days** after received comments of the Preliminary report from NEK.
- 10.21 Contractor shall provide written report of Sludge Lancing, Inner Bundle Lancing and remote visual inspection and include it in the Preliminary and Final Report. Report shall include records from the video system on computerized version (USB stick).
- 10.22 Contractor's personnel shall follow the rules and requirements for radiation protection.
- 10.23 Contractor shall agree with and qualify for General Terms for Implementation of Outage Works and other services in NEK.

- 10.24 All contractors' equipment shall be clean and proven by contractor during preparation phase at contractor's facility. Statement of equipment status shall be sent to NEK before the equipment arrives on site.
- 10.25 All contractor documents shall be in English language.
- 10.26 Bidder shall state his acceptance of this specification as a whole or in part and specify any and all other proposed approach to fulfill specific requirements.
- 10.27 Contractor shall provide a simplified and/or detailed flow diagram of the equipment planned for sludge removal activities with a list of all automatic start/stop interlocks for the said equipment.
- 10.28 Contractor shall perform classification according to document EPRI TR 1020989 SGMP: Foreign Object Prioritization for Triangular Pitch SG for all found foreign objects inside SG's.
- 10.29 Contractor shall be prepared to modify work schedule upon request from NEK due to parallel work inside SG2 and RCP2 cubicle.
- 10.30 Contractor shall not use any clear vinyl or plastic foil inside or outside Reactor Building (RB) and to uphold the rules of FME program.

11. NEK Responsibilities

- 11.1 Provide the overall activity supervision.
- 11.2 Provide the overall activity coordination.
This includes:
- communication with NEK departments involved in the service,
 - deliver: DD water, Service Air supply, Mixed BED Resins, drying equipment, etc.,
 - opening and closing of SG's secondary side inspection holes (all 4) and one SG manway on each SG.
 - coordination between the contractor and planned activities occurring in the same SG cubicle (on all elevations) at the time of sludge removal and TVI activities
- 11.3 Provide Plant's Specific training for contractor personnel including all topics as requested by item 5.1
- 11.4 Provide necessary equipment information and documentation needed for service to the contractor.
- 11.5 Check cleanliness of equipment before sludge lancing, inner bundle lancing and remote visual inspections activity starts.

- 11.6 Provide Health Physics supervision and support for contractor's personnel during performance of sludge removal and remote visual inspection.
- 11.7 Approve foreign objects retrieval method before start of retrieval.
- 11.8 Approve of cleanliness in 'No-tube lane' area and in the peripheral lanes prior to closing the inspection holes on steam generators (WP).
- 11.9 Approve nonconformance or deviation resolution and resulting corrective action to be taken.

12. Special Requirements

12.1 Organizational contact

The contractor shall coordinate all technical and schedule matters with the assigned NEK coordinator from Production department.

12.2 Terms and Conditions

- 12.2.1 All documents, daily sheets, logbooks reports etc. shall be written in English.
- 12.2.2 Contractor's supervisor will be familiar with contract contents, commercial and technical agreements and will be involved in pre-order discussions.
- 12.2.3 Contractor's supervisor will be present at all meetings with NEK.

12.3 Working conditions

- 12.3.1 Planned sludge removal and TVI activities will overlap with maintenance work on RCP2 and Eddy current inspection of SG's. During this time, special HP protection will be obligatory in SG cubicle and specified (prior agreed) maintenance personnel shall be allowed to enter the SG cubicle during the execution of sludge removal and TVI activities.
- 12.3.2 Due to overlapping activities in SG2 and RCP2 cubicle most of the equipment (suction hoses, HP hoses, and power,...) will enter the SG cubicle on elevation 100 and will be raised to the platform of SG on elevation 107, to avoid potential SL equipment damage and allow unobscured pathway for maintenance crew of RCP2.

13. QA Requirements

- 13.1 Service shall be performed in accordance with Contractor's Quality Assurance Program (QAP), which complies to 10CFR50 Appendix B and NEK QS 610 requirements, and which had been previously evaluated and accepted by NEK. Reporting of defects and noncompliance in accordance with 10CFR21 requirements, shall be implemented by Contractor. This shall apply to all activities affecting the quality of the supplied service. A copy of the QAP in the version to be applied to the service shall be made available to NEK prior to start of any activity. Site organization chart shall be presented and personnel duties and responsibilities shall be defined to satisfy 10CFR50 Appendix B requirements.
- 13.2 Contractor shall provide QA and QC coverage for full scope of the job. QA and QC personnel notifications shall be submitted. QA and QC personnel will be present at meetings with NEK, when necessary.
- 13.3 Contractor shall provide sufficient documents and records to support all the activities as required by this specification. The following, but not limited to, shall be provided:
- List of equipment per item 2.1 and 2.5 with supporting data,
 - Test report including data as required by item 2.2,
 - Listing of auxiliary equipment and consumables along with certified data on content of limiting elements for the purpose of usage inside the equipment with Safety Related designation as required by item 2.4,
 - Include a statement as required by item 2.5,
 - Listing of and essential data on the equipment as required by item 2.6 and 2.7,
 - Proof of implementation on NEK site of the 10CFR21 rules and reporting provision to NEK management,
 - Statement/report proving Drying system effectiveness as required by item 7,
 - General statement on no detrimental effect of all equipment involved on the steam generators as required by item 7,
 - Presentation to NEK of all documents as required by item 8 in due time,
 - Statement on cleanliness check of the equipment before use within NEK area as required by item 10.1,
 - Report on performed tests, as required by item 10.2,
 - Work instructions/procedures for activities as required by item 10.6,
 - References for equipment as required by item 10.12,
 - List of instrumentations and relevant valid calibration reports, certificates and documents as required by item 10.18,
 - Daily reports, Preliminary report and Final report as required by items 10.20,
 - Flow diagram as requested by item 10.27
 - Procedure for control of nonconformances including provision for reporting to the Customer,
 - Records of any Nonconformance found during the activities per this specification and resulting corrective actions taken,

- Report on actions taken to improve the activity efficiency and effectiveness, especially with regards to the Comments and Notes raised during the last campaign and the comments presented in the final report of the last SL campaign,
 - Quality Plan(s) for the job scope with provision for inclusion of Witness and Hold points, approved by Contractor QA personnel and NEK QA personnel,
 - QA and QC personnel qualification records,
 - NDE personnel qualification records (NDE Level II as minimum),
 - Operational personnel qualification records,
 - Statement not to use clear vinyl or plastic foil inside and outside RB.
- 13.4 The NEK shall have the right of access to enter the premises of the Contractor to witness inspection/test activities or to conduct surveillance or quality assurance audits. This right shall extend to the Subcontractors and will be coordinated through the Contractor.
- 13.5 The copy of the QA Program (see 13.1) shall be supplied to NEK along with the bidding documents, all other documents needed to perform the scope of this specification and mentioned under 13.3 shall be made available to NEK at **least 60 days** prior to start of outage activities (unless otherwise specified in previous chapters) to allow NEK to comment and get the documents properly corrected and be ready prior to start of field activities.
- 13.6 Final Report shall be written in accordance with QA requirements for the contractors of outage works in NEK.
- 13.7 As supporting information there are one appendices attached concerning QA requirement:
- QS 610 Rev.1 »Generic Quality Assurance Program Requirements«

14. Abbreviations

Bidder	Company bidding on the scope of service
Contractor	Company supplying the service, also; Supplier
FOSAR	Foreign Object Search And Retrieval
IBL	Inner bundle lancing
NEK	Nuklearna elektrarna Krško
NEK Coordinator	A member of NEK team in charge of SL, IBL and TVI os SG's
Purchaser	NEK, company ordering the service, also: NEK
RB	Reactor Building (controlled access area)
RCP	Reactor Coolant Pump – also primary pump
SG1	Steam generator one (RCPCSGN1)
SG2	Steam Generator two (RCPCSGN2)
SL	Sludge lancing
Sludge removal	Meaning SL or IBL or both when applicable
SR	Safety Related
WP & HP	Witness Point and Hold Point – NEK representative (coordinator, QA, etc.) must be present during these activities.

15. Attachments

- Appendix 1: QS 610 Rev.1 »Generic Quality Assurance Program Requirements«
- Appendix 2: »Agreement on Radiological Protection«
- Appendix 3: »Cable and flexible pipeline route«
- Appendix 4: “Steam generator layout and tubesheet numbering”
- Appendix 5: Steam generator drawings:
 - NDM2E – 00 – 111402, rev. H - S.G. general assembly drawing
 - NDM2E – 00 – 112729, rev. B – S.G. dimensional drawing
 - NDM2E – 00 – 112750, rev. B – Shroud
 - NDM2E – 00 – 112751, rev. B – Shroud
 - NDM2E – 11 - 112741 – Handhole screw connection
 - NDM2E – 22 – 112744, rev. A – Stud and nut for handhole



NUCLEAR POWER PLANT KRŠKO

Nuklearna Elektrarna Krško MASTER DOCUMENT	
Date Received:	07-03-2013
Log Number:	236845

QA SPECIFICATION

GENERIC QUALITY ASSURANCE PROGRAM REQUIREMENTS

QS-610, Rev. 1

Safety Related

Prepared by:


Romeo Bišćan, QA Engineer

Datum: 04/03/2013

Reviewed by:


Igor Fifnja, QA Superintendent

Datum: 05/03/2013

Approved by:


Darko Kavšek,
Quality and Nuclear Oversight Director

Datum: 5/03/2013



TABLE OF CONTENTS

Page

1.0	GENERAL	3
2.0	DEFINITIONS.....	3
3.0	DOCUMENTS FOR SUBMISSION	4
4.0	QUALITY ASSURANCE PROGRAM REQUIREMENTS.....	4
4.1	Organization.....	4
4.2	QA Program	5
4.3	Design Control	5
4.4	Procurement Document Control.....	7
4.5	Instructions, Procedures, and Drawings	8
4.6	Document Control	8
4.7	Control of Purchased Items and Services.....	9
4.8	Identification and Control of Items	10
4.9	Control of Special Processes	10
4.10	Inspection	11
4.11	Test Control.....	13
4.12	Control of Measuring and Test Equipment	14
4.13	Handling, Storage, and Shipping	15
4.14	Inspection, Test, and Operating Status	16
4.15	Control of Nonconforming Items	16
4.16	Corrective Action.....	17
4.17	Quality Assurance Records.....	17
4.18	Audits.....	18
Attachment A – QA Program Requirements, Cross Reference Table		1 to 2



1.0 GENERAL

- 1.1 This specification establishes the requirements for Supplier's QA program that shall apply to all activities affecting the quality of the supplied equipment, materials, or services.
- 1.2 Supplier shall ensure that its Subsuppliers conform to the applicable requirements of this specification.
- 1.3 For Safety Related products and services (SR), Supplier shall ensure compliance 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", ANSI/ASME N45.2-1977, "Quality Assurance Program Requirements for Nuclear Facilities"; ASME NQA-I-2008, Addenda 2009/2011, "Quality Assurance Requirements for Nuclear Facility Applications"; IAEA GS-R-3, "The Management System for Facilities and Activities"; and all other codes or standards referenced herein and in the purchase order.
- 1.4 For SR ASME Code Section III components, Supplier shall ensure compliance with the requirements of ASME Code Section III, NCA-4000 "Quality Assurance" and NCA-3800 "Metallic Material Organization's Quality System Program".
- 1.5 The reporting and posting requirements of Title 10, Code of Federal Regulations, Part 21 (10CFR21), "Reporting of Defects and Noncompliance", shall apply for SR products and services.
- 1.6 For Non-Safety Related products and services with Augmented Quality requirements (AQ), Supplier shall ensure compliance with the requirements of international standards as ISO 9001, "Quality management systems – Requirements" or ISO/IEC 17025, "General requirements for the competence of testing and calibration laboratories" or other relevant recognized standards. Additional QA requirements to the Supplier commercial QA Program shall be specified and selected in accordance with this Quality Specification and scope of supply referenced in the purchase order.
- 1.7 The Purchaser shall have the right of access to enter the premises of the Supplier to witness inspection/test activities or to conduct surveillances or quality assurance audits. This right shall extend to the Subsuppliers and will be coordinated through the Supplier.

2.0 DEFINITIONS

- 2.0 Definitions shall be as stated in ANSI N45.2.I0-1973, "Quality Assurance Terms and Definitions" and in other standards referenced herein.
- 2.1 PURCHASER - Utility issuing the purchase order.
- 2.2 SUPPLIER - The person or organization to whom a purchase order from the Purchaser has been issued.



2.3 SUBSUPPLIER - The person or organization that furnishes items and services to the Supplier that will be used to complete the Purchaser's purchase order requirements.

2.4 ABBREVIATIONS:

ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASNT	American Society for Nondestructive Testing
CFR	Code of Federal Regulation, USA
ISO	International Organization for Standardization
NEK	Nuclear Power Plant Krško
NRC	Nuclear Regulatory Commission, USA
QA	Quality Assurance
SR	Safety Related
USA	United States of America

3.0 DOCUMENTS FOR SUBMISSION

- 3.1 The Supplier shall submit a full description of its QA program, proposed for the scope of work to be performed, as controlled copy document, for the Purchaser's review and acceptance/approval.
- 3.2 If the Purchaser has already approved the Supplier's QA program, it does not have to be submitted for acceptance/approval. However, if the Purchaser's copy of the QA program is not current, all portions of the program that have been revised since the Purchaser's previous approval shall be submitted for review and acceptance/approval.

4.0 QUALITY ASSURANCE PROGRAM REQUIREMENTS

Supplier shall develop and implement a QA program consistent with the requirements defined herein and in the purchase order. As a minimum, the program shall encompass the following quality assurance criteria.

4.1 Organization

The organizational structure, functional responsibilities, levels of authority and lines of communication for personnel performing activities affecting quality shall be documented in organizational charts and written procedures.

- 4.1.1 Quality Assurance and Quality Control inspection and audit personnel shall have sufficient and well-defined responsibility, authority, and organizational freedom to identify and evaluate quality problems, to require implementation of approved corrective action, and to verify implementation



of corrective actions. Such persons or organizations shall report to a management level so that required authority and organizational freedom are provided, including sufficient independence from cost and schedule considerations.

- 4.1.2 Personnel responsible for verifying if Supplier's work conforms to established requirements shall not have direct responsibility for the work being performed.
- 4.1.3 Where more than one organization is involved in the execution of activities, the responsibilities, interfaces, and authority of each organization shall be clearly defined and documented. The external interfaces between organizations and the internal interfaces between organizational units, and changes thereto, shall be documented.

4.2 QA Program

The documented QA program shall be planned, implemented, and maintained to identify the items and services to which it applies and to comply with requirements of the relevant Code and/or Standard (See Appendix A).

- 4.2.1 The program shall provide for planning and accomplishing activities which affect quality under suitably controlled conditions. Controlled conditions include the use of appropriate equipment, suitable environmental conditions for accomplishing the activity, and assurance that prerequisites for the given activity have been satisfied.
- 4.2.2 The program shall provide for any special controls, processes, test equipment, tools, and skills necessary to attain the required quality and provide for verification of quality by inspection and test, as necessary.
- 4.2.3 The program shall provide for indoctrination and training of personnel, who is performing activities affecting quality, to ensure that suitable proficiency is achieved and maintained.
- 4.2.4 The Supplier's management shall regularly review the status and adequacy of the documented QA program.
- 4.2.5 For items which are supplied to the Purchaser as "Commercial Grade," the Supplier's program, as a minimum, shall contain procedures, processes, etc., necessary to ensure the Purchaser that the items being supplied meet industry standards, purchase order requirements, and performance or technical requirements specified in the Suppliers catalog.

4.3 Design Control

The Supplier's program for controlling design activities shall satisfy the requirements of ANSI N45.2.11-1974, "Quality Assurance Requirements for the Design of Nuclear Power Plants," or requirements of relevant Code and Standard (See Appendix A), and shall include as a minimum, the following:

- 4.3.1 Design activities shall be prescribed and accomplished in accordance with procedures of a type sufficient to ensure that applicable design inputs are correctly translated into specifications, drawings, procedures, or instructions.
- 4.3.2 Interface between organizations performing work, affecting quality of design, shall be identified in writing and shall include those organizations that provide criteria, design, specifications, and technical direction.
- 4.3.3 Applicable design inputs, such as design bases, regulatory requirements, codes and standards, shall be identified, documented, and their selection reviewed and approved. Changes from specified design inputs, including the reasons for the changes, shall be identified, approved, documented, and controlled.
- 4.3.4 Documentation of design/analysis shall be verifiable and include the following:
 - 1. The objective of the analysis,
 - 2. Design inputs and their sources,
 - 3. Results of reference document searches or other applicable background data,
 - 4. Assumptions with indication of those that must be verified as the design proceeds,
 - 5. Computer calculations, including computer type, computer program identification, revision, inputs, evidence of, or reference to computer program verification, and the bases, or reference thereto, supporting the application of the computer program to the specific problem,
 - 6. Independent review and approval.
- 4.3.5 Design verification methods shall be established to provide assurance that the design meets the specified design inputs. Acceptable verification methods include design reviews, alternate calculations, and qualification testing.
- 4.3.6 Design verification shall be performed by individuals or groups other than those who performed the original design. This verification may be performed by the originator's supervisor, if the supervisor is the only individual in the organization competent to perform the verification, and the need is documented and approved in advance by the supervisor's management.
- 4.3.7 Changes to design documents shall be reviewed and approved by the same organizations that performed the original review and approval, unless other organizations are specifically designated. This shall ensure that the impact of the change is carefully considered, required actions documented, and



information concerning the change transmitted to the affected persons and organizations.

- 4.3.8 When material substitutions or modifications in the design are made, Supplier shall:
1. Review prior design qualification tests to determine any adverse effect,
 2. Evaluate whether or not new qualification tests are required,
 3. Provide documented justification for not having to perform new qualification tests.
- 4.3.9 The software design process is documented, approved by the responsible design organization, and controlled in accordance with criteria defined in ASME NQA-1, "Quality Assurance Requirements for Nuclear Facility Applications", Part 1: Requirement 3, Section 800 – Software Design Control, Part II: Subpart 2.7, or equal standard.
- 4.3.10 To procure and utilize a Commercial Grade items and services for nuclear power plants pursuant to 10CFR21, dedication activities and controls shall be implemented in accordance with ASME NQA-1, "Quality Assurance Requirements for Nuclear Facility Applications", Subpart 2.14 to ensure the item or service is adequate for its intended safety function.

4.4 Procurement Document Control

The Supplier's program for controlling procurement documents of items and services, which are not considered to be Commercial Grade, shall satisfy the requirements of ANSI N45.2.13-1976, "Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants" or requirements of relevant Code and Standard (See Appendix A), and shall include as a minimum, the following:

- 4.4.1 Applicable design bases, quality assurance requirements, and other requirements necessary to ensure adequate quality shall be included or referenced in documents for procurement of items and services.
- 4.4.2 Procurement documents shall require Subsuppliers to have a QA program consistent with the applicable requirements of this specification.
- 4.4.3. The procurement documents shall provide for access to the Subsupplier's facilities and records for inspection or audit by Supplier's and Purchaser's representatives.
- 4.4.4. Procurement documents shall identify the documentation required to be submitted.
- 4.4.5. Procurement documents shall include the Purchaser's requirements for reporting and approving dispositions of nonconformances.

- 4.4.6. A review of the procurement documents shall be performed to ensure that the documents include appropriate technical and quality requirements.
- 4.4.7. Procurement document changes that affect technical or quality requirements shall be subject to the same degree of control as used in preparing the original document.
- 4.4.8. Procurement documents for Safety-Related equipment or services shall include statement informing Subsuppliers of their responsibility to report any defect of basic component in accordance with 10CFR21 Requirements.
- 4.4.9. Procurement documents shall include the Purchaser's requirements for ordering materials, parts or components from original Subsuppliers/Manufacturers and/or authorized distributors, to prevent supply of counterfeit/fraudulent material, items or components.

4.5 Instructions, Procedures, and Drawings

- 4.5.1 The Supplier shall ensure that all activities affecting quality and services are prescribed by and performed in accordance with documented instructions, procedures, or drawings that include or reference appropriate quantitative or qualitative criteria for determining that prescribed activities have been satisfactorily accomplished.
- 4.5.2 The need for and level of detail in written procedures or instructions shall be determined based upon complexity of the task, the significance of the item or activity, work environment, and worker proficiency and capability (education, training, experience).

4.6 Document Control

The Supplier shall ensure that quality-related documents, including changes, are reviewed for adequacy, approved for release by authorized personnel, and properly distributed to and used at locations where the prescribed activity is performed.

- 4.6.1 Document changes shall be reviewed and approved by the same organization that performed the original review and approval, unless other organizations are specifically designated.
- 4.6.2 Procedures governing document control shall be established and provide for:
 - 1. The identification of controlled documents,
 - 2. The specified distribution of controlled documents for use at the appropriate location,
 - 3. The identification of individuals responsible for the preparation, review, approval, and distribution of controlled documents,



4. Changes to documents shall be reviewed and approved by the same organizations that performed the original review and approval unless other organizations are specifically designated,
5. The review of controlled documents for adequacy, completeness, and approval prior to distribution,
6. A method to ensure the correct documents are being used.

4.7 Control of Purchased Items and Services

The Supplier's program for controlling purchased items and services shall satisfy the requirements of ANSI N45.2.13-1976, "Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants" or requirements of relevant Code and Standard (See Appendix A), and shall include as a minimum, the following:

- 4.7.1 The selection of Subsuppliers shall be based on evaluation of their capability to provide items or services in accordance with the requirements of the procurement documents.
- 4.7.2. Methods to be utilized in evaluation of Subsuppliers, and the results therefrom shall be documented and shall include the following:
 1. Evaluating the Subsupplier's history of providing a product which performs satisfactorily in actual use.
 2. Determining the Subsupplier's technical and quality capability by a review of its QA program and a direct evaluation of its facilities and the QA program implementation.
 3. Verifying if Subsupplier possesses an ASME Certificate of Authorization for the items/services, or other relevant Certificate/Accreditation related to the scope of supply.
- 4.7.3. Procedures shall be established and implemented for verification activities (surveillance, receipt inspection, and audit) as appropriate, to ensure conformance of procured items and services to identified requirements.
- 4.7.4. Where acceptance is based on certifications from Subsuppliers, the Supplier shall validate the certifications via surveillance, audit and/or independent testing.
- 4.7.5 When Commercial Grade items or services are utilized in SR applications, the dedicating entity shall apply requirements in accordance with ASME NQA-1, "Quality Assurance Requirements for Nuclear Facility Applications", Subpart 2.14, "Quality Assurance Requirements for Commercial Grade Items and Services" to ensure the item or service is adequate for its intended safety function. The Supplier shall:



1. Identify the critical characteristics (form, fit, function, material and process) of the commercial grade items and the methods for verifying that these critical characteristics have been met.
2. Establish and document measures to ensure that any changes (by Subsuppliers) in materials, product, design or manufacturing are identified and evaluated.

4.8 Identification and Control of Items

Supplier shall establish and document measures to identify and control materials, parts and components. These measures shall prevent the use of an incorrect or defective item, and suspicious (including counterfeit/fraudulent) material, parts or components that may not be as ordered. Items for production shall be identified (batch, lot, component, part) from the initial receipt and fabrication of items up to and including installation and use. This identification shall relate an item to an applicable design or other pertinent specifying document.

- 4.8.1 Traceability for these items shall be maintained with records and/or markings. Physical identification shall be used to the maximum extent possible, but if physical identification on the item is impractical or insufficient, physical segregation, procedural control or other appropriate means shall be used. Identification markings shall be applied using materials and methods that provide a clear and legible identification and do not degrade the function or service life of the item. Markings shall be transferred to each part of an item when subdivided and shall not be obliterated or hidden by surface treatment or coating unless other means of identification are substituted.

4.9 Control of Special Processes

Supplier shall establish and document measures to ensure that special processes, including welding, heat treating, cleaning, coating and nondestructive examination, are accomplished under controlled conditions in accordance with applicable codes, standards, specifications, criteria, and other special requirements.

- 4.9.1 Special process personnel, procedures, and equipment shall be qualified and comply with the requirements of applicable codes and standards. For special processes not covered by existing codes or standards, or where item quality requirements exceed the requirements of established codes or standards, the necessary qualifications of personnel, procedures, or equipment shall be defined.
- 4.9.2 All personnel performing nondestructive examination shall be qualified and certified in accordance with Recommended Practice ASNT SNT-TC-1A "Personnel Qualification and Certification in Nondestructive Testing" or shall be qualified in accordance with requirements of relevant Code and Standard (See Appendix A).



- 4.9.3 Documentation shall be maintained for currently qualified personnel, processes, or equipment in accordance with the requirements of pertinent codes and standards.

4.10 Inspection

The Supplier shall ensure that activities affecting quality are inspected for conformance to the documented instructions, procedures, and drawings used in the accomplishment of the activity.

- 4.10.1 Inspection activities shall be performed by persons other than those who performed the activity being inspected. Such persons shall not report directly to the immediate supervisors who are responsible for the work being inspected.

- 4.10.2 Inspection and test personnel shall be appropriately qualified. The program for qualifying inspection and test personnel shall be in accordance with the requirements of ANSI/ASME N45.2.6-1978, "Qualifications of Inspection, Examination, and Test Personnel for Nuclear Power Plants" or requirements of relevant Code and Standard (See Appendix A), and shall satisfy, as a minimum, the following:

1. Provisions shall be made for the indoctrination of inspection and test personnel as to the technical objectives of the work, the codes and standards that are to be used, and the quality assurance elements that are to be employed.
2. The need for formal training programs shall be determined, and such training activities shall be conducted, as required, to qualify inspection and test personnel.
3. Any special physical characteristics needed in order to perform inspection and test activities shall be identified. Inspection and test personnel requiring these characteristics shall have them verified by examination at intervals which shall not exceed one year.
4. The capabilities of inspection and test personnel shall be initially determined by an evaluation of the individual's education, experience training, test results, or proficiency demonstration.
5. The job performance of inspection and test personnel shall be reevaluated at periodic intervals not to exceed three years. Reevaluation shall be performed by evidence of continued satisfactory performance or redetermination of capability in accordance with item 4, above.
6. Inspection and test personnel who have not performed inspection/test activities for a period of one year shall be reevaluated in accordance with item 4, above.



7. Inspection and test personnel shall be certified based on their qualifications. The certification shall be documented in an appropriate form including, as a minimum, the following information:
 - a. Employer's name,
 - b. Identification of the person being certified,
 - c. Activities certified to perform,
 - d. Basis used for certification (one or more of the following):
 - i) Records of education, experience, and training,
 - ii) Test results, where applicable,
 - iii) Results of capability demonstration,
 - e. Results of periodic evaluations,
 - f. Results of physical examinations, when required,
 - g. Signature of employer's designated representative who is responsible for such certification,
 - h. Date of certification and date of certification expiration.
- 4.10.3 Written procedures shall require that inspections are performed according to instructions or checklists that are based on the instructions, procedures, and drawings used in accomplishing the inspected activity. Inspection procedures shall also require documentation of the qualitative or quantitative results of the specific parameters being inspected.
- 4.10.4 Examinations, measurements, or tests of items processed shall be performed for each work operation, where necessary to ensure quality. Where a sample is used to verify acceptability of a batch of items, the sampling procedure shall be based on recognized standard practices and adequately justify the sample size and selection process.
- 4.10.5 If inspection of processed items is impossible or disadvantageous, indirect control by monitoring processing methods, equipment, and personnel shall be provided. Process monitoring shall be performed by qualified personnel or qualified automated means. Both inspection and process monitoring shall be provided when control is inadequate without both.
- 4.10.6 Witness/hold points imposed by the Purchaser shall be indicated in appropriate documents.
- 4.10.7 Final inspection shall include a records review of the process results and resolution of nonconformances identified by prior inspection. Completed items shall be inspected for completeness, marking, calibration,

adjustments, protection from damage, or other characteristics as required, to verify the quality and conformance of the item according to specified requirements. The acceptance of the item shall be approved by authorized personnel. Any modifications, repairs, or replacements of items performed subsequent to final inspection shall require reinspection or retest, as appropriate, to verify acceptability.

4.11 Test Control

The Supplier shall establish a test program to identify and document all testing required, demonstrating that the equipment will perform satisfactorily in service. All testing shall be performed in accordance with written test procedures that incorporate all requirements and test limits specified in the design documents.

- 4.11.1 Test procedures shall ensure that prerequisite such as calibrated instrumentation, appropriate equipment, qualified personnel, condition of test equipment and the item to be tested, suitable environmental conditions, and provisions for data acquisition, are met.
- 4.11.2 Test requirements, results, and acceptance criteria shall be documented and evaluated by authorized personnel to ensure that all requirements have been satisfied.
- 4.11.3 Equipment that fails testing shall be dispositioned to ensure appropriate corrective action and retest. If dispositioned as "use as is," adequate justification shall be documented.
- 4.11.4 Test personnel shall be qualified in accordance with the requirements of paragraph 4.10.2 of this specification.
- 4.11.5 Computer program test procedures shall provide for demonstrating the adherence of the computer program to documented requirements.
 1. For computer programs used in design activities, computer program test procedures shall provide for assuring that the computer program produces correct results.
 2. For computer programs used for operational control, computer program test procedures shall provide for demonstrating required performance over the range of operation of the controlled function or process.
 3. The procedures shall also provide for evaluating technical adequacy through comparison of test results from alternative methods such as hand calculation, calculations using comparable proven programs, or empirical data and information from technical literature.
 4. In-use test procedures shall be developed and documented to permit confirmation of acceptable performance of the computer program in the operating system. In-use test procedures shall be performed after the computer program is installed on a different computer, or when there are significant changes in the operating system.



5. Periodic in-use manual or automatic self-check-in-use tests shall be prescribed and performed for those computer programs in which computer program errors, data errors, computer hardware failures, or instrument drift can affect required performance.
6. Test procedures or plans shall specify the following, as applicable:
 - a. Required tests and test sequence,
 - b. Required ranges of input parameters,
 - c. Identification of the stages at which testing is required,
 - d. Criteria for establishing test cases,
 - e. Requirements for testing logic branches,
 - f. Requirements for hardware integration,
 - g. Anticipated output values,
 - h. Acceptance criteria,
 - i. Reports, records, standard formatting, and conventions.
7. Test results shall be documented and maintained. Test results shall be evaluated by the responsible authority to ensure that test requirements have been satisfied.

4.12 Control of Measuring and Test Equipment

The Supplier shall ensure that all tools, gauges, instruments, calibration standards, and other measuring and test equipment used in activities affecting quality are of the proper range, type, and accuracy to verify conformance to established requirements. Measuring and test equipment shall be controlled, calibrated, adjusted, and maintained at prescribed intervals against certified equipment having known valid relationships to nationally recognized standards. If no national standard exists, the basis for calibration shall be documented.

- 4.12.1 Documentation shall be maintained that provides the following information for measuring and test equipment used in activities affecting quality:
 1. The identification of the items.
 2. As-found calibration data or conditions.
 3. As-left calibration data or conditions.
 4. A list of the standards used to perform the calibration.



5. A statement or information that standards or equipment are traceable to the National Bureau of Standards or accepted values of natural physical constraints.
 6. Calibration requirements that were not met.
 7. Signature of the person within the calibrator's organization who is responsible for the quality of the service provided.
- 4.12.2 Suppliers of external calibration services shall be periodically evaluated. Exceptions to this requirement are laboratories accredited by National Accreditation Body in accordance with national standards.
 - 4.12.3 When measuring and test equipment is out-of-calibration, the validity of previous inspection or test results and of the acceptability of items previously inspected or tested shall be evaluated and documented.
 - 4.12.4 Inspection, measuring, or test equipment consistently found to be out-of-calibration shall be repaired or replaced.
 - 4.12.5 Records shall be maintained and equipment suitably marked to indicate calibration status.
 - 4.12.6 Measuring and test equipment shall be properly handled and stored to maintain accuracy.
 - 4.12.7 Measuring and test equipment shall be used and calibrated in environments that are controlled to the extent necessary to ensure that the required accuracy and precision are maintained.

4.13 Handling, Storage, and Shipping

The Supplier's program for handling, storage, cleaning, packaging, shipping, and preservation of items shall be controlled to prevent damage or loss and to minimize deterioration. These activities shall satisfy the requirements of ANSI/ASME N45.2.2-1978, "Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants" or requirements of relevant Code and Standard (See Appendix A), and shall include, as a minimum, the following:

- 4.13.1. When required for critical, sensitive, perishable, or high-value items, specific procedures for handling, storage, packaging, shipping, and preservation shall be used.
- 4.13.2. Item shall be stored within a fire resistant, weathertight, and well ventilated building or equivalent enclosure and shall be placed on skids or shoring to permit air circulation.
- 4.13.3 A preventive maintenance program for item in storage shall be maintained.
- 4.13.4 Item shall be suitably packaged to protect against detrimental contamination and physical damage during shipping. Caps and plugs shall be used to seal

openings with sensitive internal surfaces and to protect threads and weld end preparations.

- 4.13.4 When required, special equipment (such as containers, shock absorbers, and accelerometers) and special protective environment (such as inert gas atmosphere, specific moisture content levels, and temperature levels) shall be specified and provided and their existence verified.
- 4.13.5 Special handling tools and equipment shall be utilized and controlled where necessary to ensure safe and adequate handling. Special handling tools and equipment shall be inspected and tested in accordance with procedures at specified time intervals or prior to use.
- 4.13.6 Marking or labeling shall be utilized as necessary to adequately maintain and preserve the item, including indication of the presence of special environments or the need for special controls.

4.14 Inspection, Test, and Operating Status

The Supplier shall establish measures to identify the status of inspection and test activities either on the items or in documents traceable to the items. These measures are necessary to ensure that required inspections and tests are performed and to ensure that items that have not passed the required inspections and tests are not inadvertently used.

- 4.14.1 Status shall be maintained through indicators such as physical location and tags, markings, shop travelers, stamps, inspection records, or other suitable means.
- 4.14.2 The authority for application and removal of tags, markings, labels, and stamps shall be specified.

4.15 Control of Nonconforming Items

The Supplier shall ensure that items, services, or activities that do not conform to requirements are identified, documented, evaluated and dispositioned (use-as-is, rework, repair, or reject) in accordance with documented procedures.

- 4.15.1 Written procedures shall define the responsibility and authority of those personnel involved in issuing and dispositioning nonconforming items or conditions.
- 4.15.2 Procedures shall provide for evaluation of nonconforming items or conditions for reportability in accordance with 10CFR21. For Safety Related items and/or services ordered from the USA, Supplier and Subsupplier reporting pursuant to 10CFR21 shall be made to the NRC and NEK. For Safety Related items and/or services supplied from outside the USA, Supplier and Subsupplier shall be subject to the reporting pursuant to 10CFR21 to the NEK, only.



- 4.15.3 Written descriptions of nonconformances dispositioned “use-as-is” or “repair” shall include appropriate technical justification to substantiate the disposition and shall be submitted to the Purchaser for review and acceptance of those changes affecting customer design requirements.
- 4.15.4 Repaired and reworked items shall be reexamined in accordance with applicable procedures and with the original acceptance criteria. Repaired items can be reexamined in accordance with alternate acceptance criteria, if disposition has been approved by the Purchaser.
- 4.15.5 When a nonconforming item has been dispositioned as “reject”, controls shall be implemented and adequate records shall be maintained to verify the item has not been used.
- 4.15.6 Nonconforming items shall be segregated, when practical, by placing items in clearly identified and designated hold areas until properly dispositioned. When size, weight, or access limitations preclude segregation, other precautions shall be employed to prevent inadvertent use of the item.
- 4.15.7 Nonconforming items shall not be shipped or installed without the prior written approval of the Purchaser's responsible personnel.

4.16 Corrective Action

The Supplier shall ensure that conditions adverse to quality are promptly identified and corrected.

- 4.16.1 In the case of significant conditions adverse to quality, the cause of the condition shall be determined and corrective action taken to preclude recurrence.
- 4.16.2 The identification of significant conditions adverse to quality, the cause of the conditions, and the corrective action taken shall be documented and reported to appropriate levels of management. Follow-up action shall be taken to verify completion of corrective action.
- 4.16.3 Review of corrective actions shall be performed to determine if they were timely and effectively implemented.

4.17 Quality Assurance Records

The Supplier shall establish procedures to identify the specific records that will be generated and maintained and to prescribe their retention periods and storage requirements.

- 4.17.1 Records shall include drawings, specifications, purchase documents, work orders, material certifications, calculations, inspection and test reports, work procedures, nonconformance and corrective action reports, audit reports, software design verification and computer program testing records, personnel, process, and equipment qualification records.



- 4.17.2 Inspection, test, and work performance monitoring records shall indicate the nature of observations, the acceptable limits of parameters checked, the qualitative or quantitative results, the actions taken in connection with any identified deficiencies, the date of the observation, and the identity of personnel involved.
- 4.17.3 Required records shall be legible, identifiable, and retrievable.
- 4.17.4 A system for controlling and monitoring legibility and accuracy for radiograph reproductions shall be included in the quality assurance program. This system shall include procedures for exposure, scanning, focusing, contrast, resolution, and distinguishing film artifacts.
- 4.17.5 All maintained records shall have clear identification markings that can be traced to a specific job or item and shall be entered into a system that provides for timely retrieval.
- 4.17.6 Records retention periods and storage requirements shall satisfy the requirements of ANSI/ASME N45.2.9-1979, "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants" or requirements of relevant Code and Standard (See Appendix A), or the Supplier shall, as a minimum, transmit identifiable and reproducible copies of all records as delineated by Purchaser at the time of shipment.

4.18 Audits

The Supplier shall establish a system of audits to ensure compliance with all aspects of the quality assurance program and to determine its effectiveness. Written procedures and controls shall comply with the requirements of ANSI/ASME N45.2.12-1977, "Requirements for Auditing of Quality Assurance Programs for Nuclear Power Plants" or requirements of relevant Code and Standard (See Appendix A), and shall include, as a minimum, the following:

- 4.18.1 Audits shall be scheduled at a frequency commensurate with the status and importance of the activity.
- 4.18.2 An audit plan which identifies the audit scope, requirements, audit personnel, activities to be audited, organizations to be notified, applicable documents scheduled and audit procedures or checklists shall be developed and documented for each audit.
- 4.18.3 Auditors shall not have any direct responsibility for performance of the activities they audit.
- 4.18.4 Audit team shall be identified prior to the beginning of the audit, consisting of one or more auditors, and shall include an individual, who is a qualified Lead Auditor, appointed to lead the team.
- 4.18.5 Audits shall be performed in accordance with written procedures or checklist.



- 4.18.6 Audit results shall be documented by the auditing personnel and shall be reviewed by management responsible for the area audited. Conditions requiring prompt corrective action shall be reported immediately to management of the audited organization.
- 4.18.7 Audit reports shall be signed by the audit team leader and shall include the following information:
1. Description of the audit scope.
 2. Identification of the auditors.
 3. Identification of persons contacted during audit activities.
 4. Summary of audit results.
 5. A statement on the effectiveness of the program elements which were audited.
 6. Description of each reported adverse audit finding in sufficient detail to enable corrective action to be taken by the audited organization.
- 4.18.8 Follow-up action shall be taken to verify that corrective action is implemented as scheduled.
- 4.18.9 Audit records shall be maintained and shall include audit plans, audit reports, written replies, and the record of completion of corrective action.
- 4.18.10 Lead Auditors shall be qualified in accordance with the requirements of ANSI/ASME N45.2.23-1978, "Qualification of Quality Assurance Program Audit Personnel for the Nuclear Power Plants", or requirements of relevant Code and Standard (See Appendix A), and shall satisfy, as a minimum, the following requirements:
1. Lead Auditors shall be trained to the extent necessary to ensure their competence in auditing skills. Training in the following areas shall be given based upon management evaluation of the needs of each Lead Auditor: nuclear-related codes, standards and regulations; general structure of quality assurance programs; auditing techniques of examining, evaluating, and reporting; and audit planning.
 2. Initial qualification of Lead Auditors shall be determined according to the individual's education, experience, training, auditing skills, and capabilities.
 3. Lead Auditors shall pass an examination which shall evaluate their competence in auditing skills.
 4. The proficiency of each Lead Auditor shall be assessed by management on an annual basis. Based on this assessment, management may extend the qualification, require retraining or require requalification.
 5. The qualification of Lead Auditors shall be certified in writing in an appropriate form, including the following information:



- a. Employer's name,
 - b. Lead Auditor's name,
 - c. Date of certification or recertification,
 - d. Basis for qualification (i.e., education, experience, training, examination, etc.),
 - e. Signature of employee's designated representative who is responsible for this certification.
6. Records for each Lead Auditor shall be maintained and updated annually.



Attachment A
QA Program Requirements - Cross Reference Table

QA PROGRAM ELEMENTS	SAFETY RELATED ITEMS NON ASME CODE	SAFETY RELATED ITEMS ASME CODE		AUGMENTED QUALITY ITEMS	
	10CFR50 App.B ASME NQA-1/ANSI N45.2	ASME III NCA-4000	ASME III NCA-3800	ISO 9001	ISO 17025
1.0 GENERAL					
1.1; 1.2; 1.7	X	X	X	X	X
1.3	X				
1.4		X	X		
1.5	X	X	X		
1.6				X	X
2.0 DEFINITIONS	X	X	X	X	X
3.0 DOCUMENTS FOR SUBMISSION	X	X	X	X	X
4.0 QA PROGRAM REQUIREMENTS					
4.1 Organization	X	X	X	X	X
4.2 QA Program	X	X	X	X	X
4.3 Design Control					
4.3.1 – 4.3.9	X	X	X	X	
4.3.10	X	X	X		
4.4 Procurement					
4.4.1 – 4.4.7; 4.4.9	X	X	X	X	X
4.4.8	X	X	X		
4.5 Instructions, Procedures, and Drawings	X	X	X	X	X
4.6 Document Control	X	X	X	X	X
4.7 Control of Purchased Items and Services					
4.7.1 – 4.7.4	X	X	X	X	X
4.7.5	X	X	X		



Attachment A
QA Program Requirements - Cross Reference Table

QA PROGRAM ELEMENTS	SAFETY RELATED ITEMS NON ASME CODE	SAFETY RELATED ITEMS ASME CODE		AUGMENTED QUALITY ITEMS	
	10CFR50 App.B ASME NQA-1/ANSI N45.2	ASME III NCA-4000	ASME III NCA-3800	ISO 9001*	ISO 17025
4.8 Identification and Control of Items	X	X	X	X	X
4.9 Control of Special Processes	X	X	X	X	X
4.10 Inspection	X	X	X	X	X
4.11 Test Control	X	X	X	X	X
4.12 Control of Measuring and Test Equipment	X	X	X	X	X
4.13 Handling, Storage, and Shipping	X	X	X	X	X
4.14 Inspection, Test, and Operating Status	X	X	X	X	X
4.15 Control of Nonconforming Items					
4.15.1; 4.15.3 – 4.15.7	X	X	X	X	X
4.15.2	X	X	X		
4.16 Corrective Action	X	X	X	X	X
4.17 Quality Assurance Records	X	X	X	X	X
4.18 Audits	X	X	X	X	X

Note: * To compare requirements of ASME NQA-1 and ISO 9001 for QA Program differences identification use ASME NQA-1b-2011, Part IV, Subpart 4.3 "Application Guidance on the Use of the ISO 9001:2008, Quality Management Systems Standard for Compliance With NQA1-2008, Part I, With the NQA-1a-2009 Addenda"

NUKLEARNA ELEKTRARNA KRŠKO, d.o.o., Vrbina 12, 8270 Krško, represented by Mr. Stanislav Rožman, Director (hereinafter referred to as NEK)

and

(hereinafter referred to as outside undertaking)

have concluded this

A G R E E M E N T

on Radiological Protection

Article 1

- (1) The parties to this Agreement have determined that in accordance with the Law on Protection against Ionising Radiation and Nuclear Safety (Official Gazette of the Republic of Slovenia No. 67/2002, hereinafter referred to as the Law) they are obliged to define the responsibilities of NEK and the outside undertaking performing activities in the radiation controlled area to assure operational protection of outside workers exposed to the risk of ionising radiation at NEK.
- (2) The parties shall agree that the Agreement thereof only applies to radiation controlled area.
- (3) Outside undertaking performing activities in radiation controlled area assumes the responsibility to meet NEK's requirements for radiation protection of its employees.

Article 2

- (1) Basic responsibilities of NEK and outside undertaking regarding radiation protection are the following:
 - NEK and outside undertaking shall be liable for personal radiation exposure of outside workers; the doses received shall not exceed the prescribed dose limits.
 - NEK and outside undertaking shall be responsible for providing the information and training to the workers in the field of radiation protection.
 - NEK and outside undertakings are responsible that individual exposures of the workers are assessed in accordance to valid regulations.
 - NEK shall ensure that the radiological data of the individual exposure monitoring of each of its outside worker are sent also in the Slovenian central dose register.
 - The outside undertaking shall ensure medical surveillance of its workers according to the rules for exposed workers.
 - NEK shall ensure that the requirements for operational protection of exposed workers are implemented in accordance with the Law.
- (2) NEK shall be directly responsible for safety of outside workers exposed to ionising radiation in their workplace to the extent which is directly related to the nature of the controlled area and of the activities therein.
- (3) Before the start of any activity in a controlled area, the outside undertaking shall transmit to NEK particulars concerning the outside workers' identity, the medical approval of workers' fitness, the date of the last medical examination and the results of the individual exposure monitoring for the last five years and cumulative dose.

- (4) NEK shall transmit the outside worker's individual exposure monitoring from the previous paragraph of this Article to the Ministry of the Republic of Slovenia, competent for Health, to record radiological data into a central national dose record.
- (5) Both NEK and the outside undertaking shall not start work with exposed workers if the data are not submitted as specified in paragraph (3) of this Article, or if the worker is not registered in a central national dose record, or if the submitted data make evident that based on the said Law the workers are not permitted to perform work in radiation controlled area.
- (6) Each exposed worker of outside undertaking is responsible to take his own radiation protection measures as much as possible as set out in this Agreement or in accordance with the precautions against ionizing radiation at NEK.
- (7) A cross-frontier outside undertaking may perform activities in the radiation controlled area only after obtaining the relevant permit in his country under conditions and procedures equivalent to those specified in the Law.
- (8) The outside undertaking shall, prior to the start of any activity in radiation controlled area, submit to NEK a certificate indicating that the conditions of the previous paragraph have been met issued by the Ministry of the Republic of Slovenia, competent for environment.

Article 3

- (1) The outside undertaking at NEK shall, before the start of work at the latest, designate a responsible person for radiation protection. On behalf of the outside undertaking the responsible person shall arrange with NEK and its unit of Technical Operations - Radiation Protection Department - all liabilities under this Agreement.
Responsible person for radiation protection is: _____
Address: _____
E-mail address: _____ Telephone No.: _____

Article 4

- (1) The outside undertaking shall supply to NEK particulars about its workers as stated in Article 2, paragraph 3 of the Agreement thereof concerning the worker's identity, including the worker's date and place of birth, sex and personal identification number (if available).
- (2) Medical surveillance of exposed workers shall be the responsibility of the outside undertaking and an approved medical practitioner. Medical certificate shall include that the worker is fit for the tasks assigned to him, and fit for the use of personal protective respiratory equipment. A medical exam shall also include a drug and alcohol abuse test. Limited ability to work shall be expressly indicated in such medical certificate.
- (3) Outside undertaking shall ensure that the radiological data of individual exposure monitoring recorded by an authorised institution or NEK dosimetry are submitted to the approved medical practitioner; the results of the individual monitoring shall be made available to the worker concerned.
- (4) Data on personal doses of exposed workers are forwarded to the competent medical service for further processing and to the central dose register on the basis of a written consent of the exposed worker.
- (5) The outside undertaking shall take care that the employee exposed to radiation signs a written statement that the data on his personal doses may be submitted for further processing in accordance with this Agreement. The written statement shall be attached to the data as provided for under Article 2, paragraph (3) of this Agreement.
- (6) If exposed workers, apprentices or students refuse to sign the above said statement, the outside undertaking shall not assign them to any work involving exposure to ionising radiation.

Article 5

- (1) By signing the Agreement thereof, NEK assumes the responsibility for radiation protection pursuant to the Agreement thereof. The outside undertaking shall be responsible for its workers as agreed upon in the Agreement thereof. The outside undertaking shall bear material and criminal responsibility for its employees to meet the requirements of radiation protection and safe use of radiation sources in their workplace.
- (2) The outside undertaking shall take care that its employees follow the provisions of Article 2, paragraph (6) of this Agreement and use personal protective equipment in accordance with NEK's internal instructions and all necessary dosimeters.
The employee himself is responsible for proper use of personal dosimeters, access to workplace, attention to radiological labels, safety at work labels and other prescribed instructions.
- (3) The outside undertaking shall designate a leader for work in the controlled area. The work leader shall take care that his workers are acquainted with radiological and safety at work measures and that they follow the instructions submitted by NEK. The work leader is responsible that its workers are familiar with the scope of work prior to work start, possess necessary tools and are informed about special administrative radiation protection instructions for particular jobs assigned to them. The Work Leader or responsible person of the outside undertaking for radiation protection shall upon NEK's proposal participate in preparations of administrative instructions in order to consider dose limits and reduce exposure to ionising radiation.

Article 6

- (1) Any differences or disputes arising from or in connection with this Agreement shall be settled by an amicable effort on the part of both parties hereto. If an attempt by the parties to arrive at a settlement has failed, any differences or disputes shall be finally settled by the competent Court in Krško.

Article 7

- (1) This Agreement shall become effective after its signature by the authorised representatives of both parties.

Article 8

- (1) This Agreement has been written in two originals, from which each party retains one copy.

Krško, _____

Outside undertaking:

NEK:

President of the Management Board
Stanislav Rožman

Member of the Management Board
Hrvoje Perharić

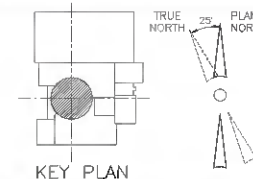
APPENDIX 3

Emergency Airlock
- connection for
hoses from SG to
outside unit

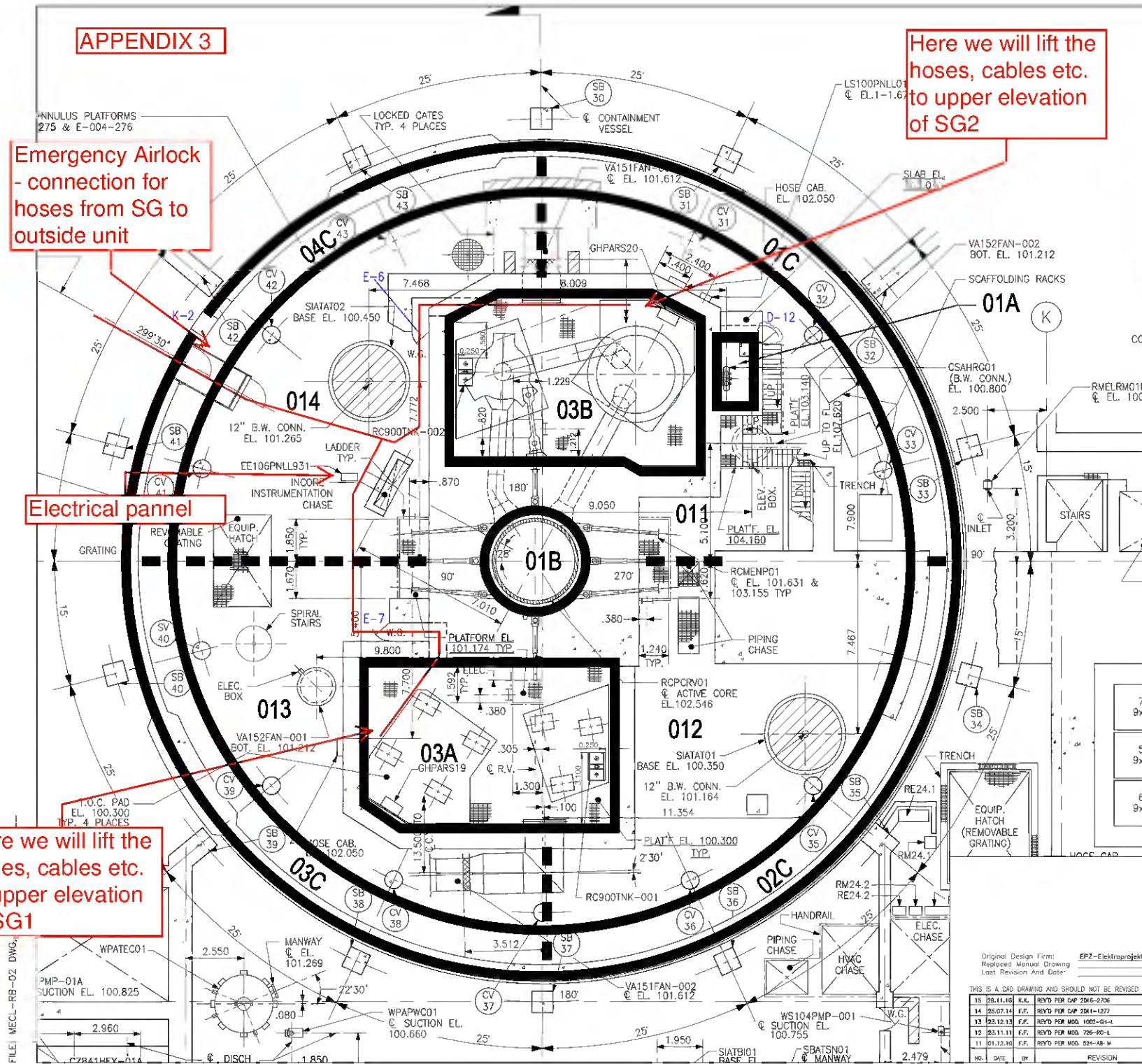
Here we will lift the
hoses, cables etc.
to upper elevation
of SG2

Electrical pannel

Here we will lift the
hoses, cables etc.
to upper elevation
of SG1



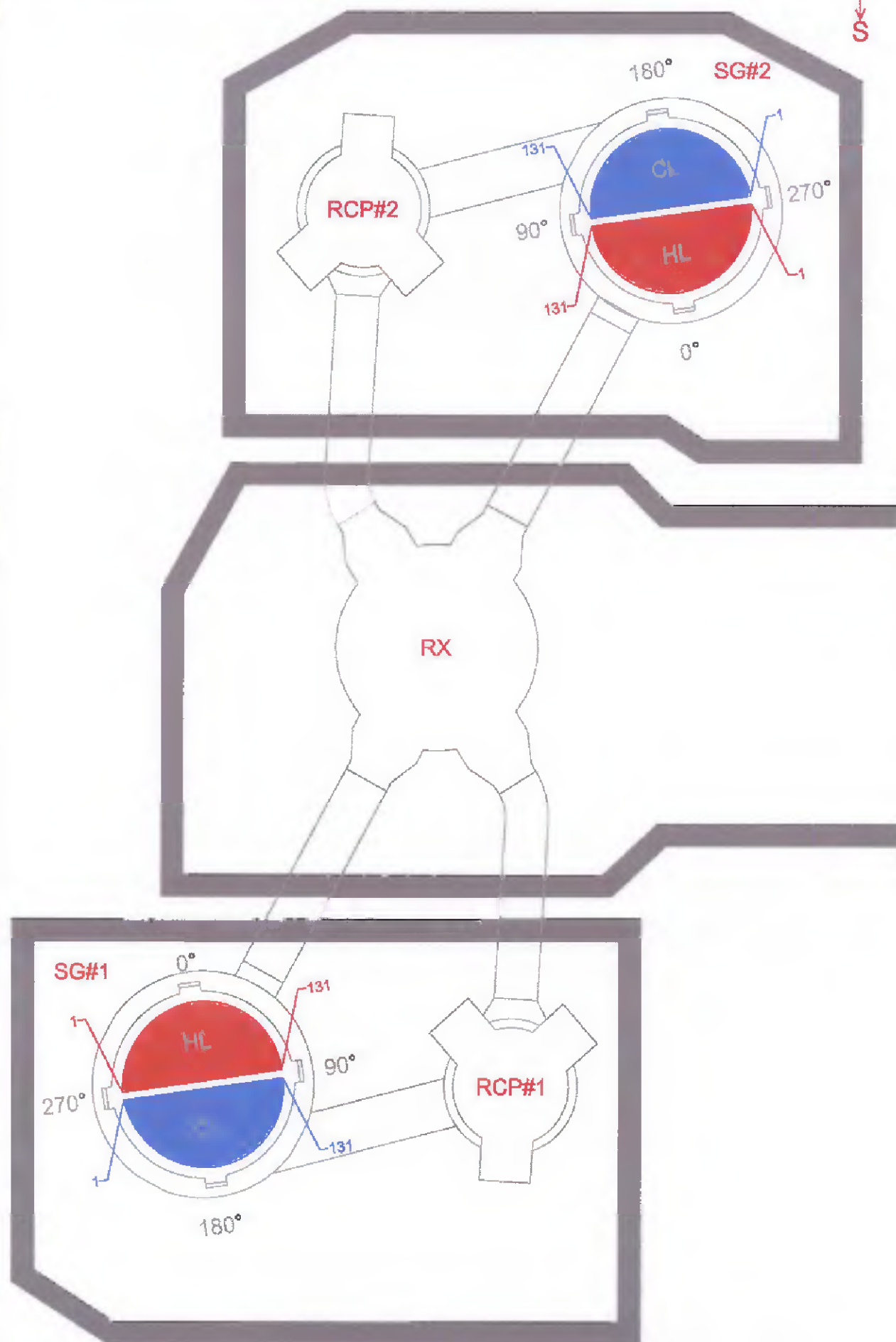
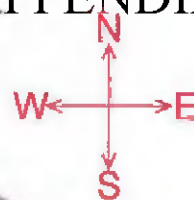
FIRE AREA	MECL ROOM	ROOM DESCRIPTION
	01A	REGENERATIVE HEAT EXCHANGER ROOM
	01B	REACTOR VESSEL & INCORE INSTRUMENTATION AREA
	01C	NE ANNULUS (0°-90°)
	02C	SE ANNULUS (90°-180°)
	03A	SC01 AND RCPC01 CUBICLE
RB	03B	SG02 AND RCPC02 CUBICLE
	03C	SW ANNULUS (180°-270°)
	04C	NW ANNULUS (270°-360°)
	011	RB NE QUADRANT (0°-90°)
	012	RB SE QUADRANT (90°-180°)
	013	RB SW QUADRANT (180°-270°)
	014	RB NW QUADRANT (270°-360°)

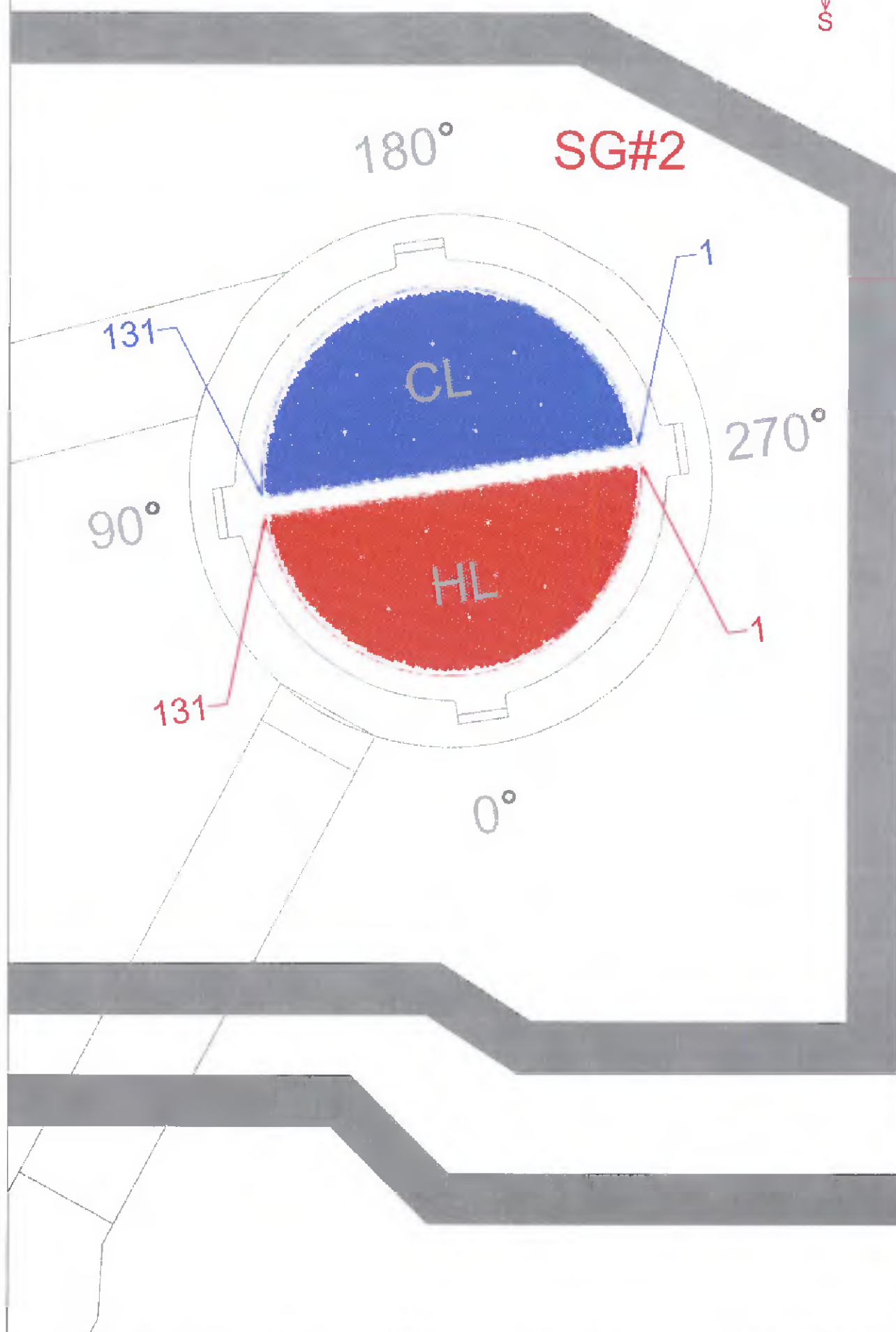
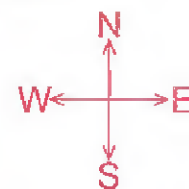


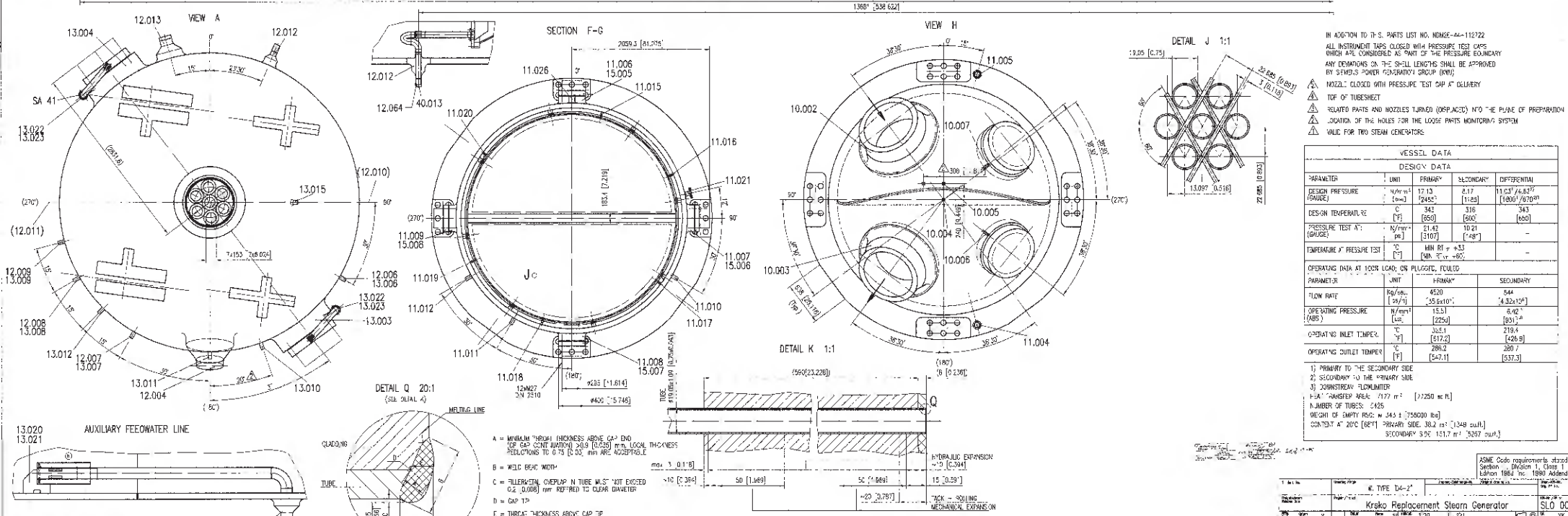
Original Design Firm: EPZ-Elektroprojekt Zagreb
Replaced Manual Drawing
Last Revision And Date:

THIS IS A CAD DRAWING AND SHOULD NOT BE REVISED OR MODIFIED MANUALLY			
NO.	DATE	BY	REVISION
15	20.11.10	K.K.	REVZ PER ČP 226-6-2206
14	20.07.14	F.F.	REVZ PER ČP 226-1-1277
13	23.12.13	F.F.	REVZ PER MOD. 1002-SH-L
12	23.11.11	F.F.	REVZ PER MOD. 726-RO-W
11	01.12.10	F.F.	REVZ PER MOD. 594-AB-W

NUKLEARNA ELEKTRARNA KRŠKO NUCLEAR POWER PLANT KRŠKO			
MECL PLANT LAYOUT DRAWING			
REACTOR BUILDING RB			
ELEVATION 100.30			
DESIGN ENGINEERING			
MADE	CHECKED	APPROVAL	
1. M. KODRČ	2. M. TUMPA	3. M. PODHRASKI	
REFERENCE DRAWINGS: E-004-233, Rev.32			
MECL-RB-02		15	





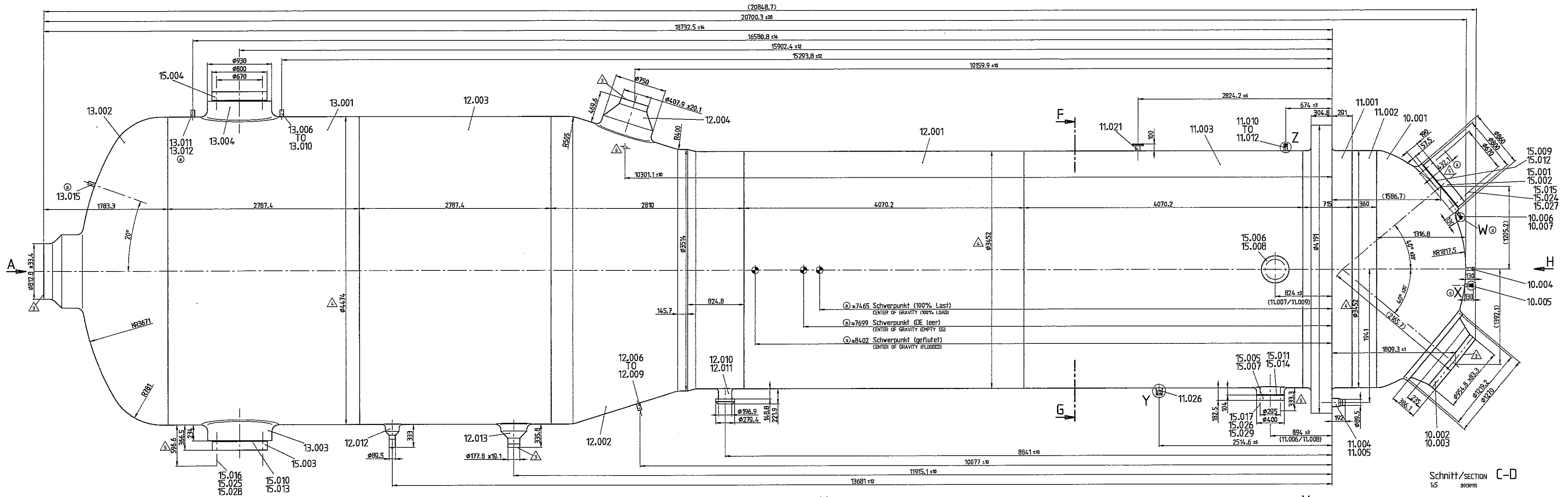
LONGITUDINAL SECTION (0°-180°) 

△ VALID FOR TWO STEAM GENERATORS

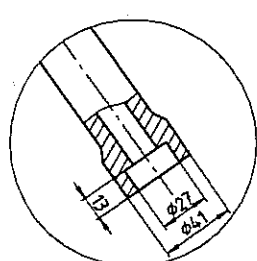
1) PRIMARY TO THE SECONDARY SIDE
2) SECONDARY TO THE PRIMARY SIDE
3) DOWNSTREAM FLOWLIMITER
HEAD "TRANSFER AREA" 177 m² [22250 ac ft]
NUMBER OF TUBES: 3426
WEIGHT OF EMPTY PSC: W 343 ± [756000 lbs]
CONSTANT AT 20°C [68°F] PRIMARY SIDE: 38.2 m³ [1348 cu ft]
SECONDARY SIDE: 151.7 m³ [5367 cu ft]

[illegible]

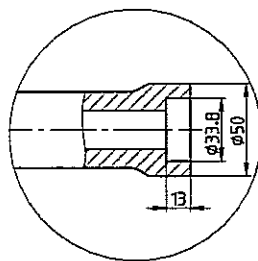
Längsansicht / LONGITUDINAL VIEW
(gedreht gezeichnet / TURNED DRAWN)
(KRS4.70)



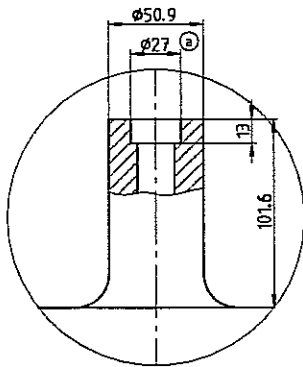
Einzelheit / DETAIL W
1:2 (KRS4.70)



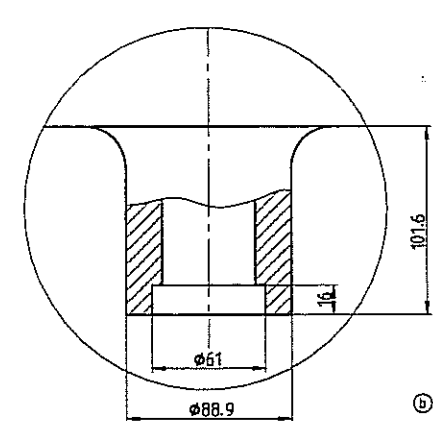
Einzelheit / DETAIL X
1:2 (KRS4.70)



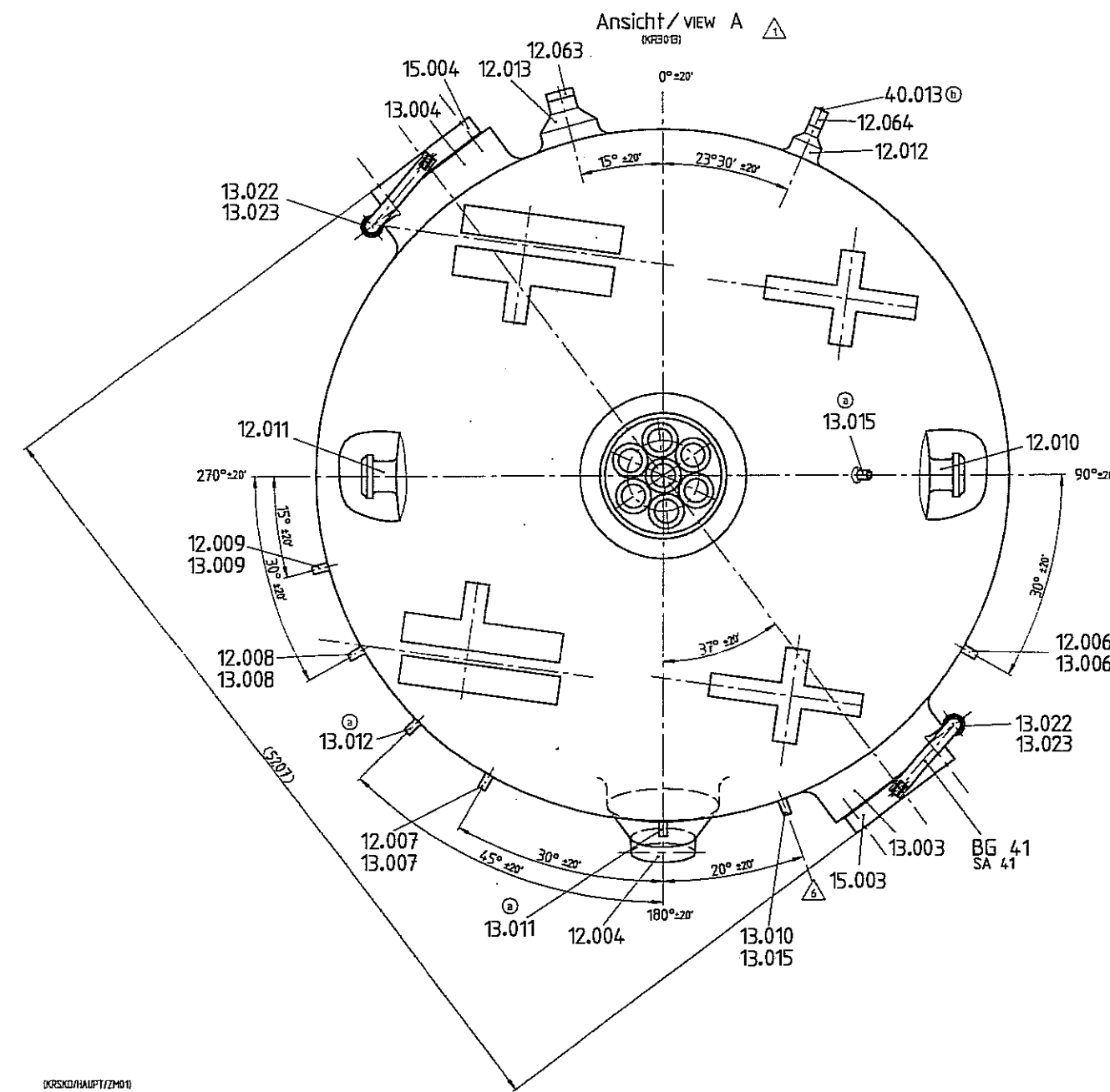
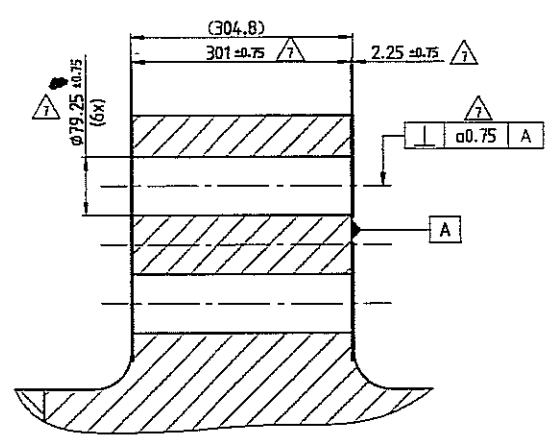
Einzelheit / DETAIL Z
1:2 (KRS4.70)



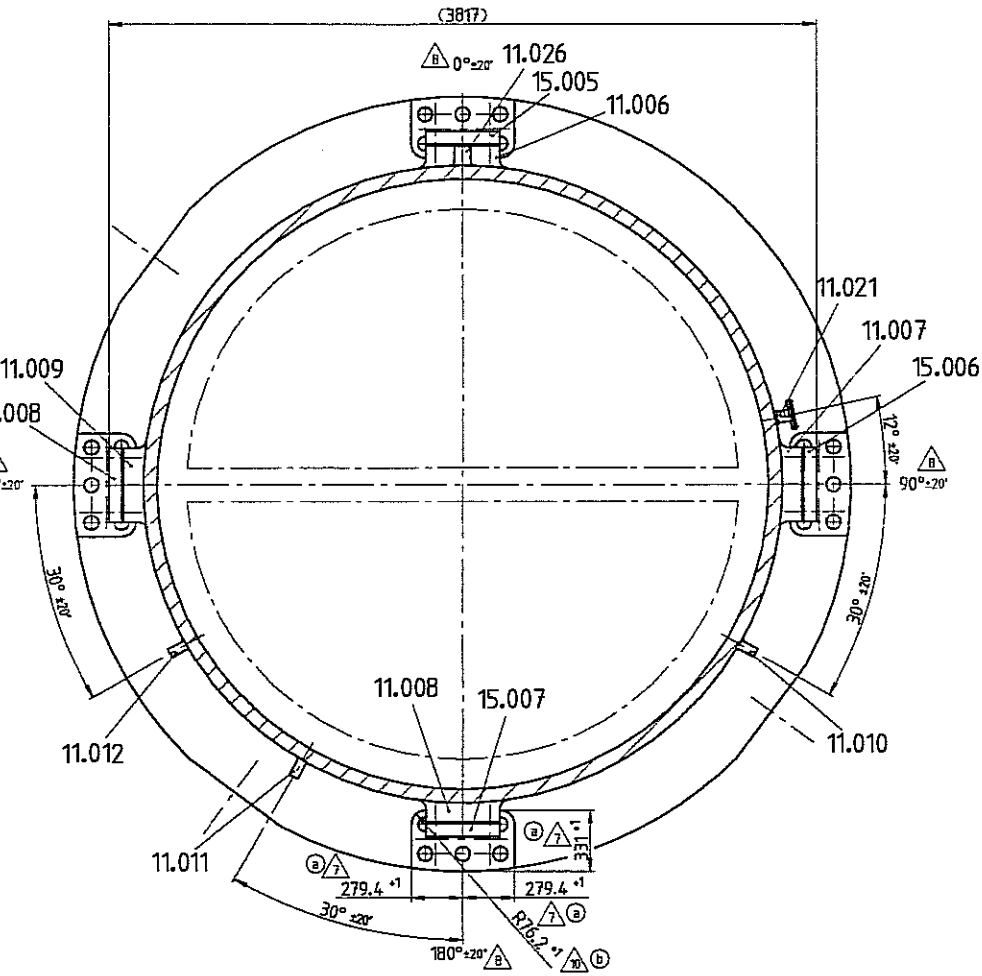
Einzelheit / DETAIL Y
1:2 (KRS4.70)



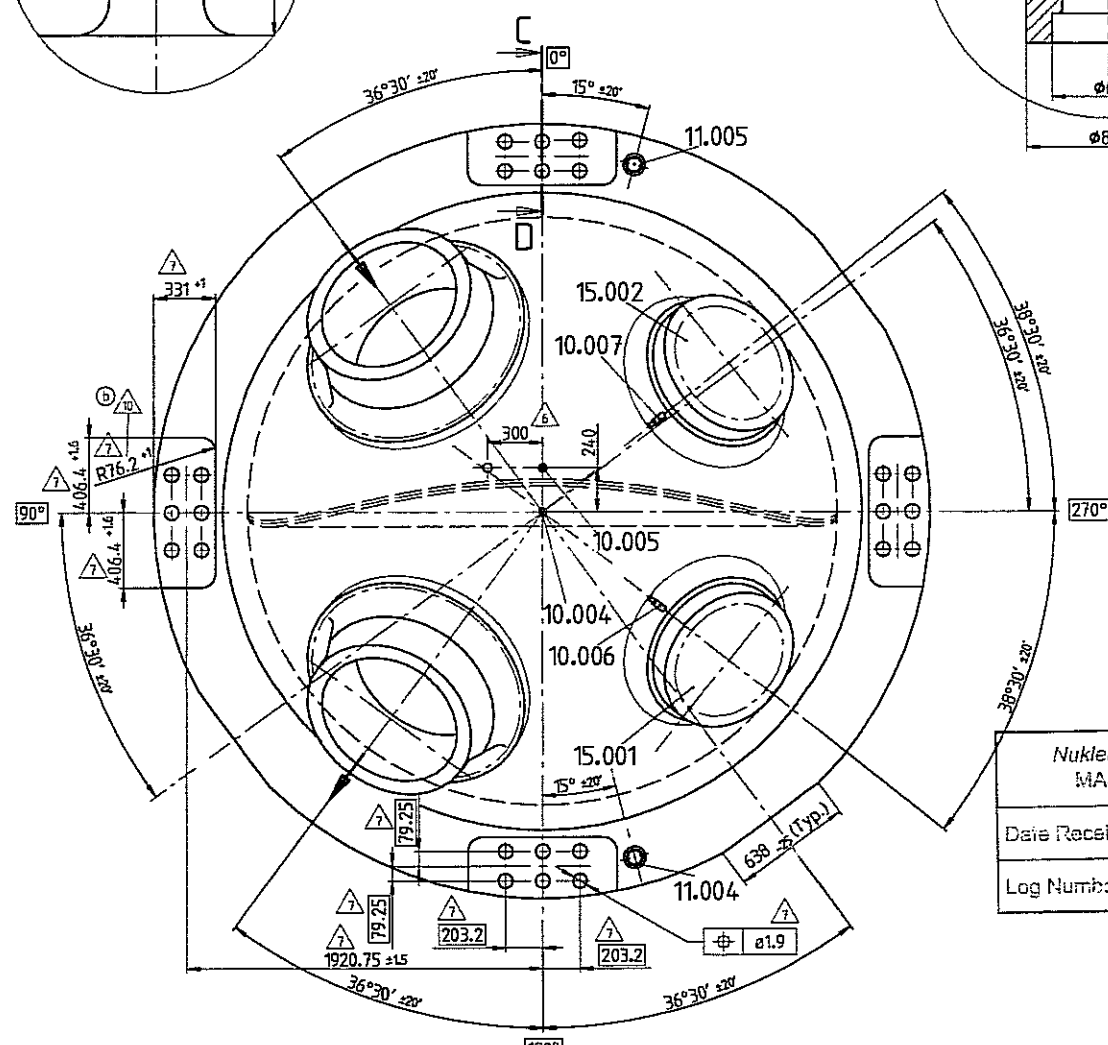
Schnitt / SECTION C-D
1:5 (KRS4.70)



Schnitt / SECTION F-G
1:2 (KRS4.70)



Ansicht / view H
(KRS4.70)



- Am DE 2 R80¹
AT SE 2
- ⚠ Gültig für alle Instrumentierungsschutzen. Diese Schutzen sind mit Druckprobendeckeln verschlossen, die als Teil der druckführenden Umschließung betrachtet werden. THESE NOZZLES ARE CLOSED WITH PRESSURE TEST CAPS, WHICH ARE CONSIDERED AS PART OF THE PRESSURE BOUNDARY.
 - ⚠ Toleranzen gelten für die Schutzen. TOLERANCES VALE FOR THE NOZZLES.
 - ⚠ Lage der Bohrungen und Bearbeitungsmaße typ. für vier Stellen. LOCATION OF THE HOLES FOR THE LOOSE PARTS MONITORING SYSTEM.
 - ⚠ Lage der Löcher für Körperschallaufnehmer. LOCATION OF THE HOLES FOR THE LOOSE PARTS MONITORING SYSTEM.
 - ⚠ Ende der Stützschrauben inklusive Kappen. END OF STUDY SCREWS INCLUDING CAPS.
 - ⚠ Durchmesser sind von jedem Schuß zu messen und zu protokollieren. DIAMETER SHALL BE MEASURED AND RECORDED FOR EACH SHOT.
 - ⚠ Schutzen mit Druckprobendeckel verschlossen (Auslieferungszustand). NOZZLE CLOSED WITH PRESSURE TEST CAP DELIVERY CONDITION.
 - ⚠ Betroffene Teile und Schutzen in Darstellungsebene gedreht (versetzt). RELATED PARTS AND NOZZLES TURNED (DISPLACED) INTO THE PLANE OF PREPARATION.
- Für die Kontrolle aller Maße ist eine Maßanweisung zu erstellen. Die Maßergebnisse sind in einer Ausmaßzeichnung zu protokollieren. MEASURING INSTRUCTION SHEET TO BE PREPARED FOR THE CHECK OF ALL DIMENSIONS. RESULT OF DIMENSIONAL CHECKS SHALL BE RECORDED IN THE AS-BUILT DRAWING.
- Schutzen ohne Transportdeckel (Druckprobendeckel) dargestellt. NOZZLES DRAWN WITHOUT COVERS FOR TRANSPORTATION (PRESSURE TEST) CAP.
- Fehlende Angaben siehe Baugruppenzeichnungen. MISSING DATA SEE DRAWINGS OF SUBASSEMBLIES.

Nuklearelektrik Krško
MASTER DOCUMENT

Date Received: 12.08.1999
Log Number: 209505

Revised: 12.08.1999
Log Number: 209505
NKM2E-44-112722
ASME Code requirements stated by Section III, Division 1, Class 1 Edition 1989 and 1990 Addenda

1. List No.				W. TYPE "04-2"				Krsko Replacement Steam Generator				SLO 001			
Revision				Project / Projekt				Drawing / Zeichnung				Scale / Maßstab			
1.0				1.0				1.0				1.0			
2.0				2.0				2.0				2.0			
3.0				3.0				3.0				3.0			
4.0				4.0				4.0				4.0			
5.0				5.0				5.0				5.0			
6.0				6.0				6.0				6.0			
7.0				7.0				7.0				7.0			
8.0				8.0				8.0				8.0			
9.0				9.0				9.0				9.0			
10.0				10.0				10.0				10.0			
11.0				11.0				11.0				11.0			
12.0				12.0				12.0				12.0			
13.0				13.0				13.0				13.0			
14.0				14.0				14.0				14.0			
15.0				15.0				15.0				15.0			
16.0				16.0				16.0				16.0			
17.0				17.0				17.0				17.0			
18.0				18.0				18.0				18.0			
19.0				19.0				19.0				19.0			
20.0				20.0				20.0				20.0			
21.0				21.0				21.0				21.0			
22.0				22.0				22.0				22.0			
23.0				23.0				23.0				23.0			
24.0				24.0				24.0				24.0			
25.0				25.0				25.0				25.0			
26.0				26.0				26.0				26.0			
27.0				27.0				27.0				27.0			
28.0				28.0				28.0				28.0			
29.0				29.0				29.0				29.0			
30.0				30.0				30.0				30.0			
31.0				31.0				31.0				31.0			
32.0				32.0				32.0				32.0			
33.0				33.0				33.0				33.0			
34.0				34.0				34.0				34.0			
35.0				35.0				35.0				35.0			
36.0				36.0				36.0				36.0			
37.0				37.0				37.0				37.0			
38.0				38.0				38.0				38.0			
39.0				39.0				39.0				39.0			
40.0				40.0				40.0				40.0			
41.0				41.0				41.0				41.0			
42.0				42.0				42.0				42.0			
43.0				43.0				43.0				43.0			
44.0				44.0				44.0				44.0			
45.0				45.0				45.0				45.0			
46.0				46.0				46.0				46.0			
47.0				47.0				47.0				47.0			
48.0				48.0				48.0				48.0			
49.0				49.0				49.0				49.0			
50.0				50.0				50.0				50.0			
51.0				51.0				51.0				51.0			
52.0				52.0				52.0				52.0			
53.0				53.0				53.0				53.0			
54.0				54.0				54.0				54.0			
55.0				55.0				55.0				55.0			
56.0				56.0				56.0				56.0			
57.0				57.0				57.0				57.0			
58.0				58.0				58.0				58.0			
59.0				59.0				59.0				59.0			
60.0				60.0				60.0				60.0			
61.0				61.0				61.0				61.0			
62.0				62.0				62.0				62.0			
63.0				63.0				63.0				63.0			
64.0				64.0				64.0				64.0			
65.0				65.0				65.0				65.0			
66.0				66.0				66.0				66.0			
67.0				67.0				67.0				67.0			
68.0				68.0				68.0				68.0			
69.0				69.0				69.0				69.0			
70.0				70.0				70.0				70.0			
71.0				71.0				71.0				71.0			
72.0				72.0				72.0				72.0			
73.0				73.0				73.0				73.0			
74.0				74.0				74.0				74.0			
75.0				75.0				75.0				75.0			
76.0				76.0				76.0				76.0			
77.0				77.0				77.0				77.0			
78.0				78.0				78.0				78.0			
79.0				79.0				79.0				79.0			
80.0				80.0				80.0				80.0			
81.0				81.0				81.0				81.0			
82.0				82.0				82.0				82.0			
83.0				83.0				83.0				83.0			
84.0				84.0				84.0				84.0			
85.0				85.0				85.0				85.0			
86.0				86.0				86.0				86.0			
87.0				87.0				87.0				87.0			
88.0				88.0				88.0				88.0			
89.0				89.0				89.0				89.0			
90.0				90.0				90.0				90.0			
91.0				91.0				91.0				91.0			
92.0				92.0				92.0				92.0			
93.0				93.0				93.0				93.0			
94.0				94.0				94.0				94.0			
95.0				95.0				95.0				95.0			
96.0				96.0				96.0				96.0			
97.0				97.0				97.0				97.0			
98.0				98.0				98.0				98.0			
99.0				99.0				99.0				99.0			
100.0				100.0				100.0				100.0			
101.0				101.0				101.0				101.0			
102.0				102.0				102.0				102.0			
103.0				103.0				103.0				103.0			
104.0				104.0				104.0				104.0			
105.0				105.0				105.0				105.0			
106.0				106.0				106.0				106.0			
107.0				107.0				107.0				107.0			
108.0				108.0				108.0				108.0			
109.0				109.0				109.0				109.0			
110.0				110.0				110.0				110.0			
111.0				111.0				111.0				111.0			
112.0				112.0				112.0				112.0			
113.0				113.0				113.0				113.0			
114.0				114.0				114.0				114.0			
115.0				115.0				115.0				115.0			
116.0				116.0				116.0				116.0			
117.0				117.0				117.0				117.0			
118.0				118.0				118.0				118.0			
119.0				119.0				119.0				119.0			
120.0				120.0				120.0				120.0			
121.0				121.0				121.0				121.0			
122.0				122.0				122.0				122.0			
123.0				123.0				123.0				123.0			
124.0				124.0				124.0				124.0			
125.0				125.0				125.0				125.0			
126.0				126.0				126.0				126.0			
127.0				127.0				127.0				127.0			
128.0				128.0				128.0				128.0			
129.0				129.0				129.0				129.0			
130.0				130.0				130.0				130.0			
131.0				131.0				131.0				131.0			
132.0				132.0				132.0				132.0			
133.0				133.0				133.0				133.0			
134.0				134.0				134.0				134.0			
135.0				135.0				135.0				135.0			
136.0				136.0				136.0				136.0			
137.0				137.0				137.0				137.0			
138.0				138.0				138.0				138.0			
139.0				139.0				139.0				139.0			
140.0				140.0				140.0				140.0			
141.0				141.0				141.0				141.0			
142.0				142.0				142.0				142.0			
143.0				143.0				143.0				143.0			
144.0				144.0				144.0				144.0			
145.0				145.0				145.0				145.0			
146.0				146.0				146.0				146.0			
147.0				147.0				147.0				147.0			
148.0				148.0				148.0				148.0			
149.0				149.0				149.0				149.0			
150.0				150.0				150.0				150.0			
151.0				151.0				151.0				151.0			
152.0				152.0				152.0				152.0			
153.0				153.0				153.0				153.0			
154.0				154.0				154.0				154.0			
155.0				155.0				155.0				155.0			
156.0				156.0				156.0				156.0			
157.0				157.0				157.0				157.0			
158.0				158.0				158.0				158.0			
159.0				159.0				159.0				159.0			
160.0				160.0				160.0				160.0			
161.0				161.0				161.0				161.0			
162.0				162.0				162.0				162.0			
163.0				163.0				163.0				163.0			
164.0				164.0				164.0				164.0			
165.0				165.0				165.0				165.0			
166.0				166.0				166.0				166.0			
167.0				167.0				167.0				167.0			
168.0				168.0				168.0				168.0			
169.0				169.0				169.0				169.0			
170.0				170.0				170.0				170.0			
171.0				171.0				171.0				171.0			
172.0				172.0				172.0				172.0			
173.0				173.0				173.0				173.0			
174.0				174.0				174.0				174.0			
175.0				175.0				175.0				175.0			
176.0				176.0				176.0				176.0			
177.0				177.0				177.0				177.0			
178.0				178.0				178.0				178.0			
179.0				179.0				179.0				179.0			
180.0				180.0				180.0				180.0			
181.0				181.0				181.0				181.0			
182.0				182.0				182.0				182.0			
183.0				183.0				183.0				183.0			
184.0				184.0				184.0				184.0			
185.0				185.0				185.0				185.0			
186.0				186.0				186.0				186.0			
187.0				187.0				187.0				187.0			
188.0				188.0				188.0				188.0			
189.0				189.0				189.0				189.0			
190.0				190.0				190.0				190.0			
191.0				191.0				191.0				191.0			
192.0				192.0				192.0				192.0			
193.0				193.0				193.0				193.0			
194.0				194.0				194.0				194.0			
195.0				195.0				195.0				195.0			
196.0				196.0				196.0				196.0			
197.0				197.0				197.0				197.0			
198.0				198.0				198.0				198.0			
199.0				199.0				199.0				199.0			
200.0				200.0				200.0				200.0			
201.0				201.0				201.0				201.0			
202.0				202.0				202.0				202.0			
203.0				203.0				203.0				203.0			
204.0				204.0				204.0				204.0			
205.0				205.0				205.0				205.0			
206.0				206.0				206.0				206.0			
207.0				207.0				207.0				207.0			
208.0				208.0				208.0				208.0			
209.0				209.0				209.0				209.0			
210.0				210.0				210.0				210.0			
211.0				211.0				211.0				211.0			
212.0				212.0				212.0				212.0			
213.0				213.0				213.0				213.0			
214.0				214.0				214.0				214.0			
215.0				215.0				215.0				215.0			
216.0				216.0				216.0				216.0			
217.0				217.0				217.0				217.0			
218.0				218.0				218.0				218.0			
219.0				219.0				219.0				219.0			
220.0				220.0				220.0				220.0			
221.0				221.0				221.0				221.0			
222.0				222.0				222.0				222.0			
223.0				223.0				223.0				223.0			
224.0				224.0				224.0				224.0			
225.0				225.0				225.0				225.0			
226.0				226.0				226.0				226.0			
227.0				227.0				227.0				227.0			

Schnitt / SECTION B-B
1:2
gedreht gezeichnet / TURNED DRAWN

[illegible]

Technical drawing of a mechanical part, likely a flange or base plate, showing dimensions and tolerances. The part is circular with a central square hole. Key dimensions and features include:

- Overall outer diameter: 170
- Inner square hole side length: 110
- Distance from outer edge to inner square hole corner: 15
- Angle at the corner: 45°
- Distance from outer edge to the center of the circular holes: 30
- Distance from the center of the circular holes to the inner square hole corner: 35
- Distance from the center of the circular holes to the inner square hole corner: 50
- Radius of the circular holes: R11
- Surface texture symbol: 32.002/10
- Surface texture symbol: 6.3

(83)

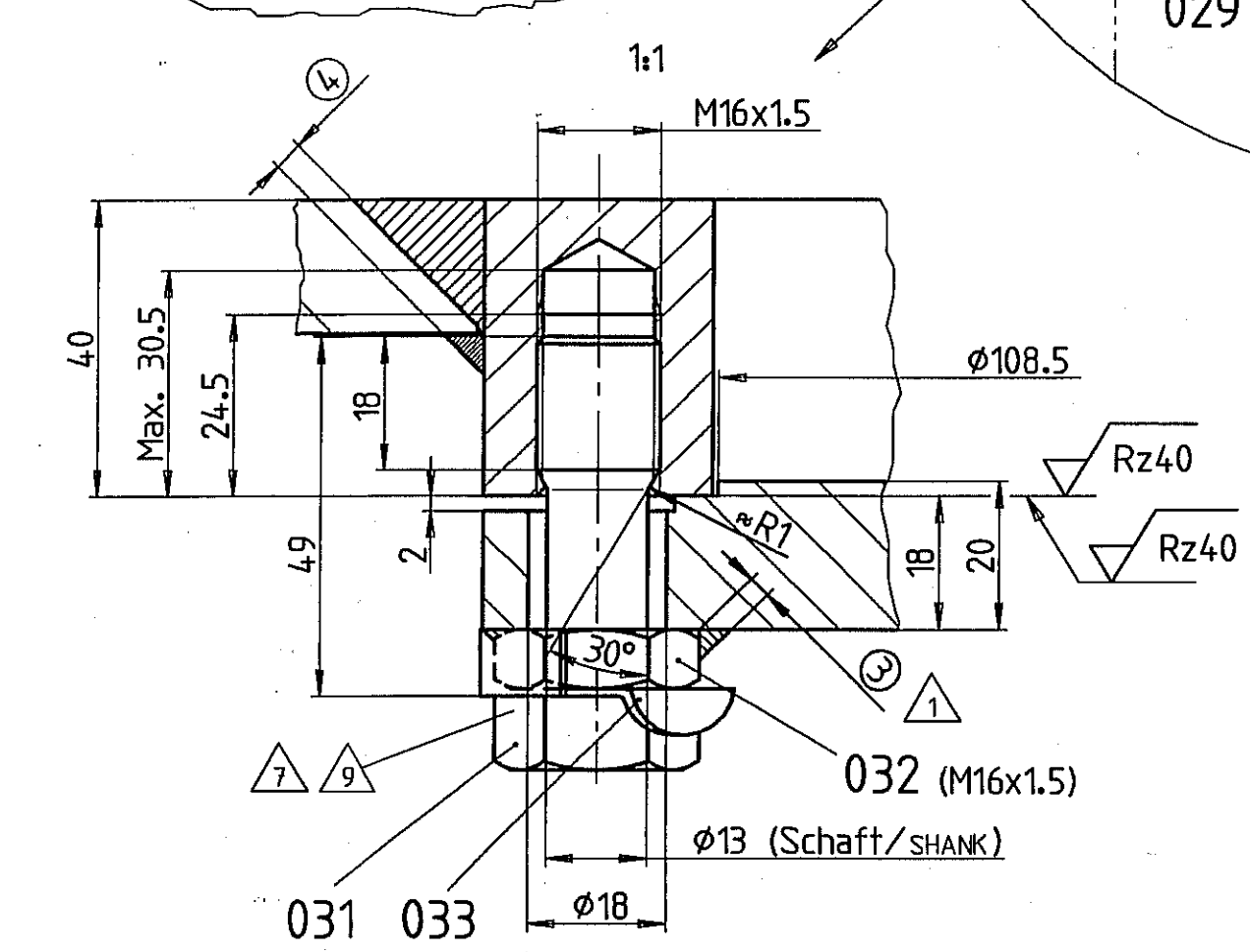
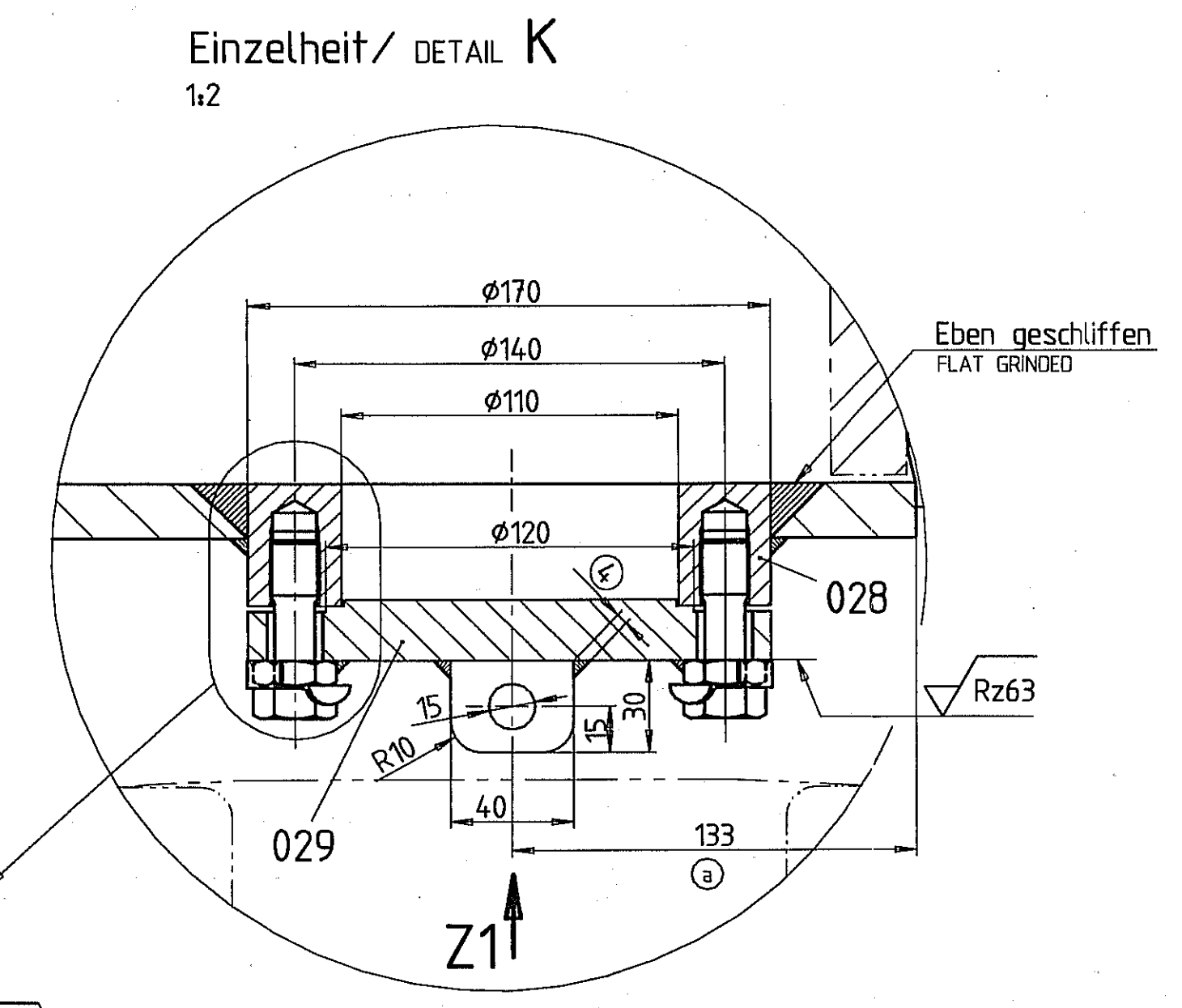
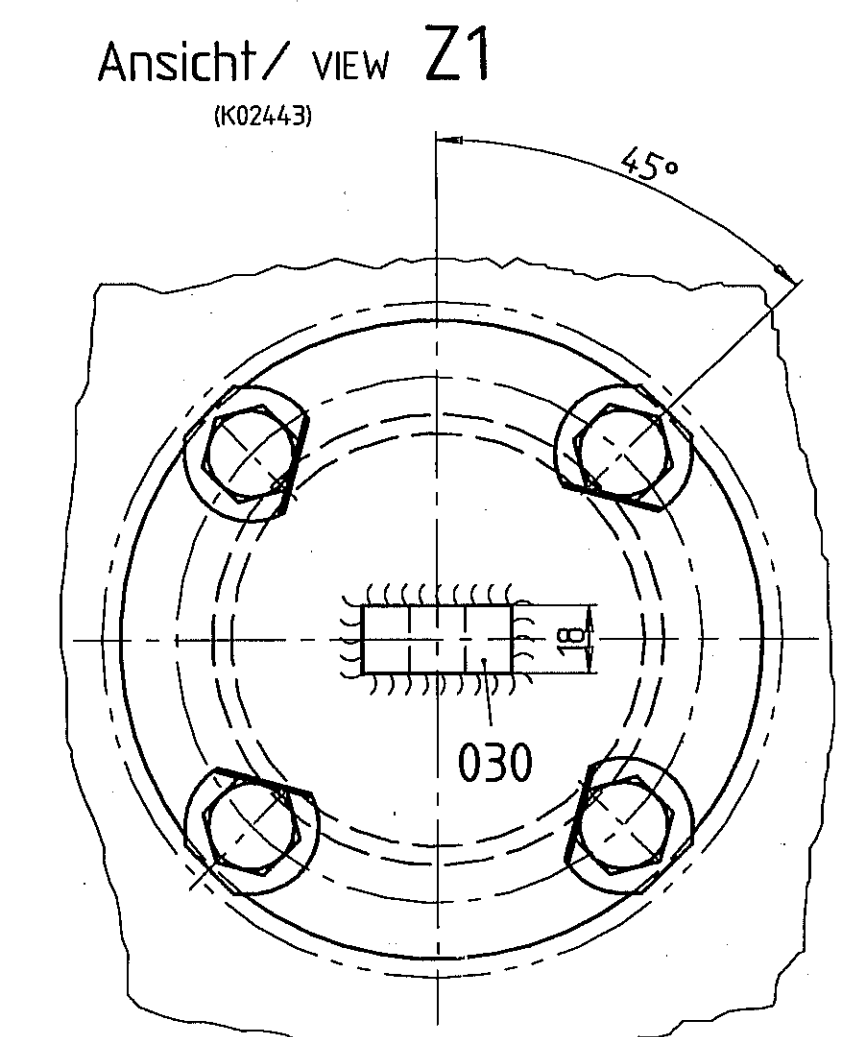
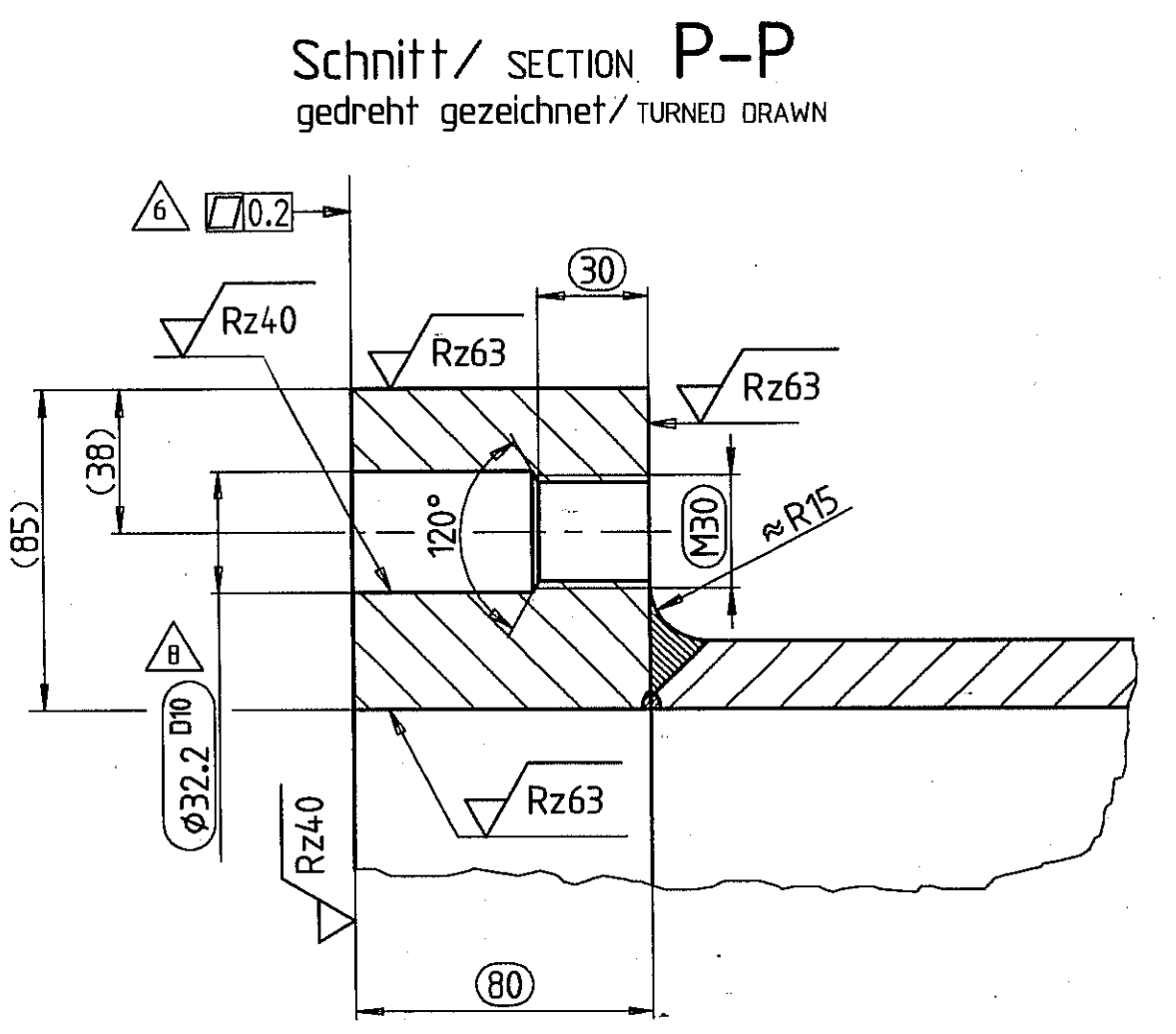
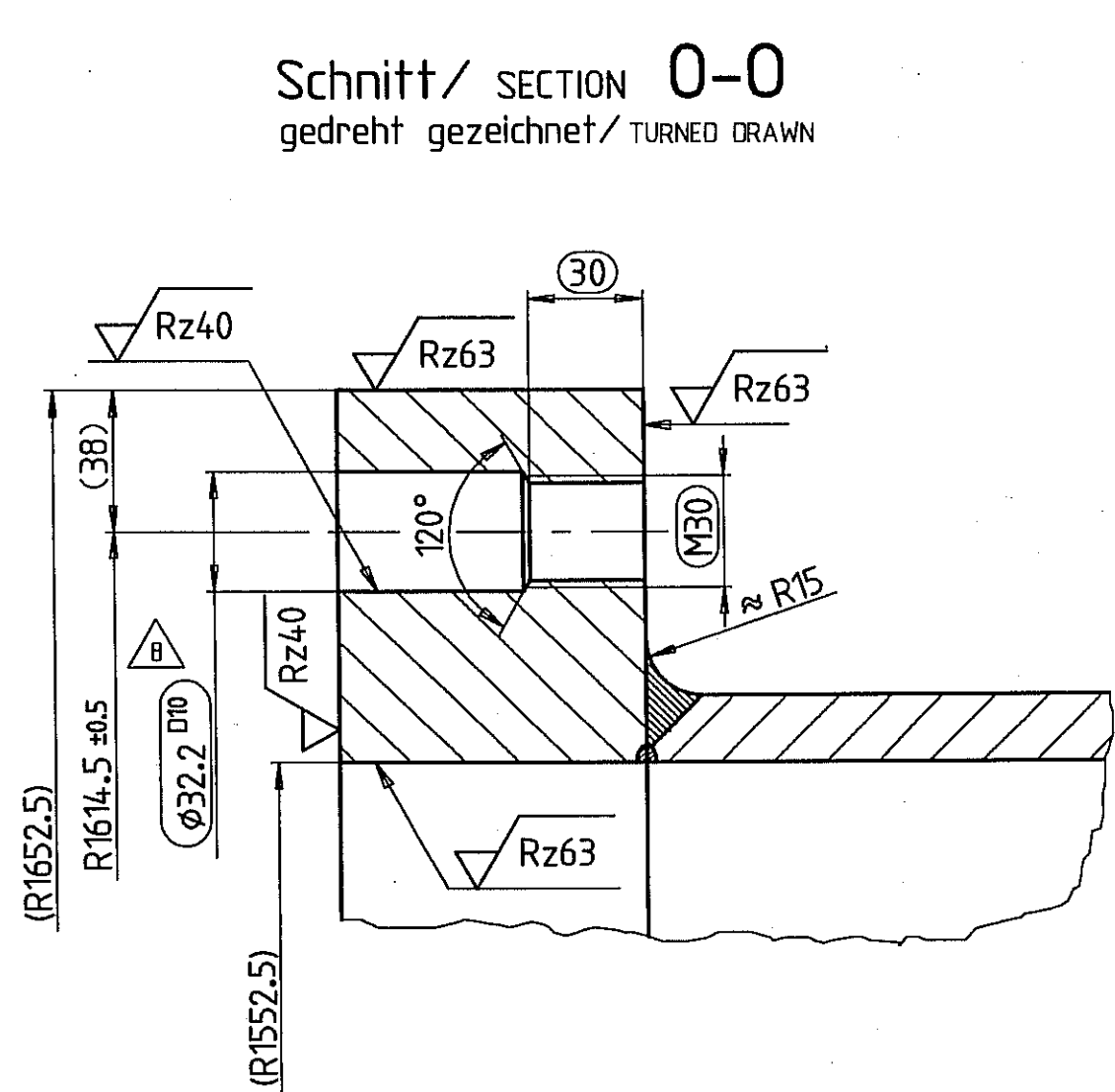
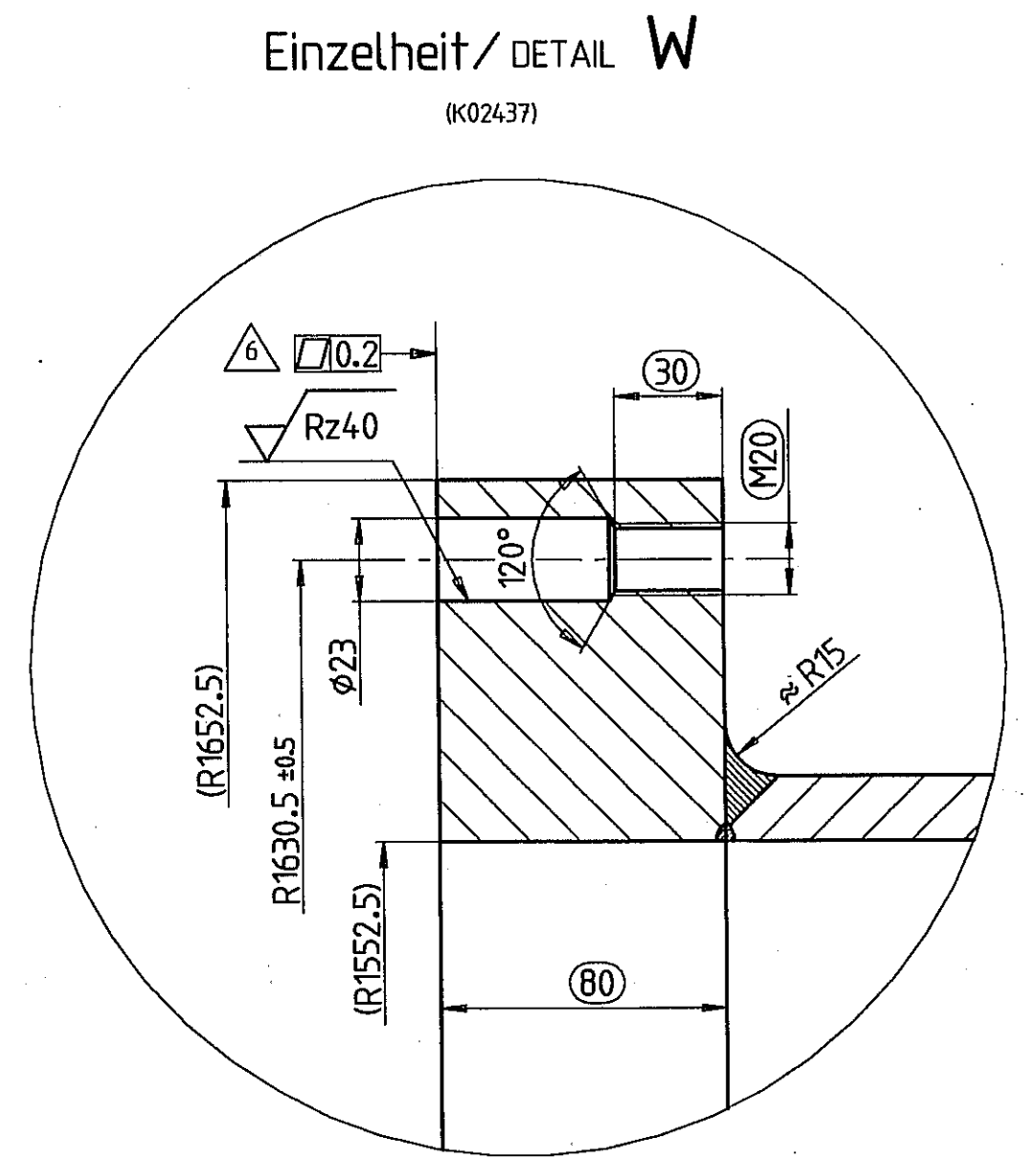
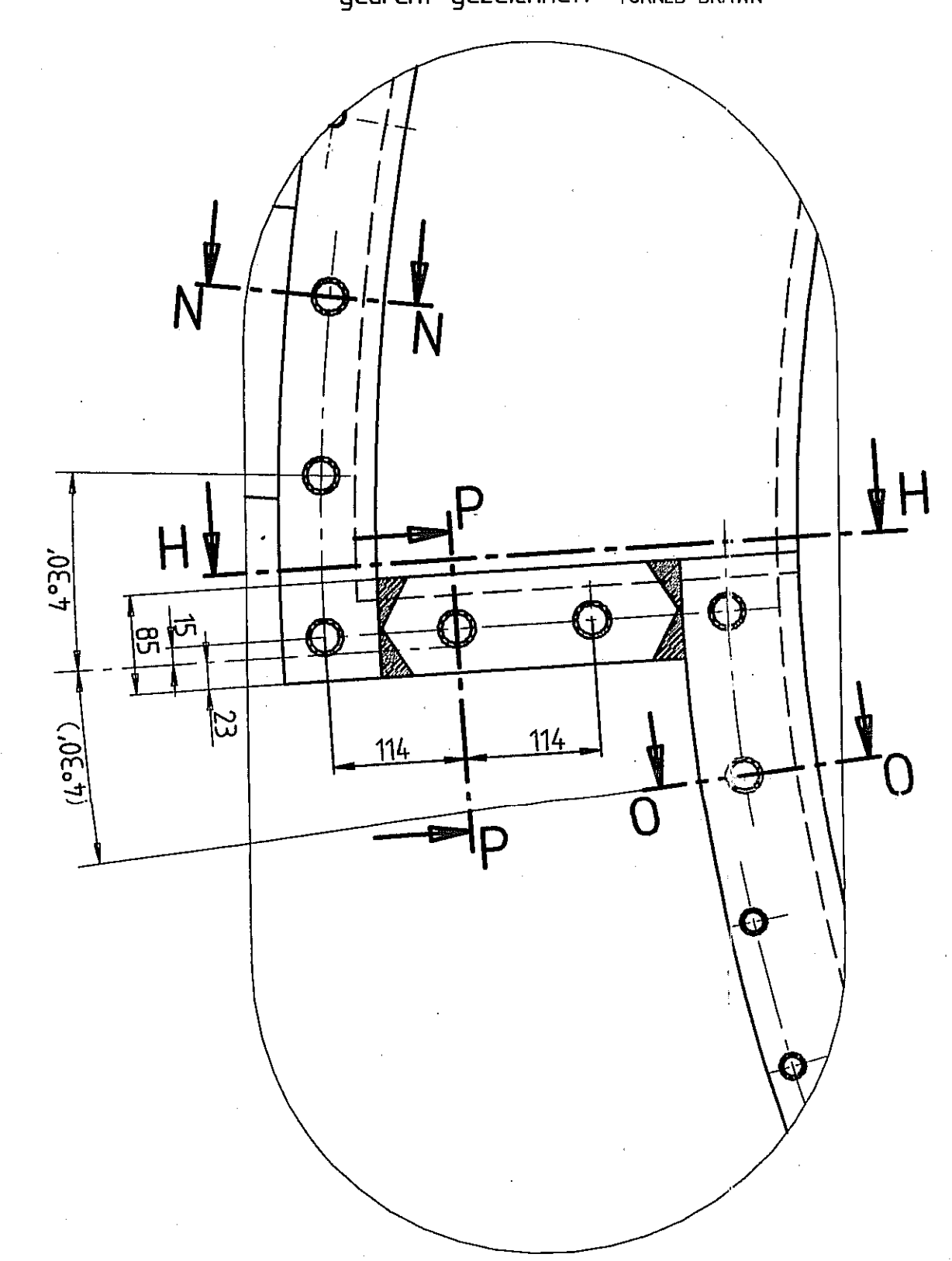
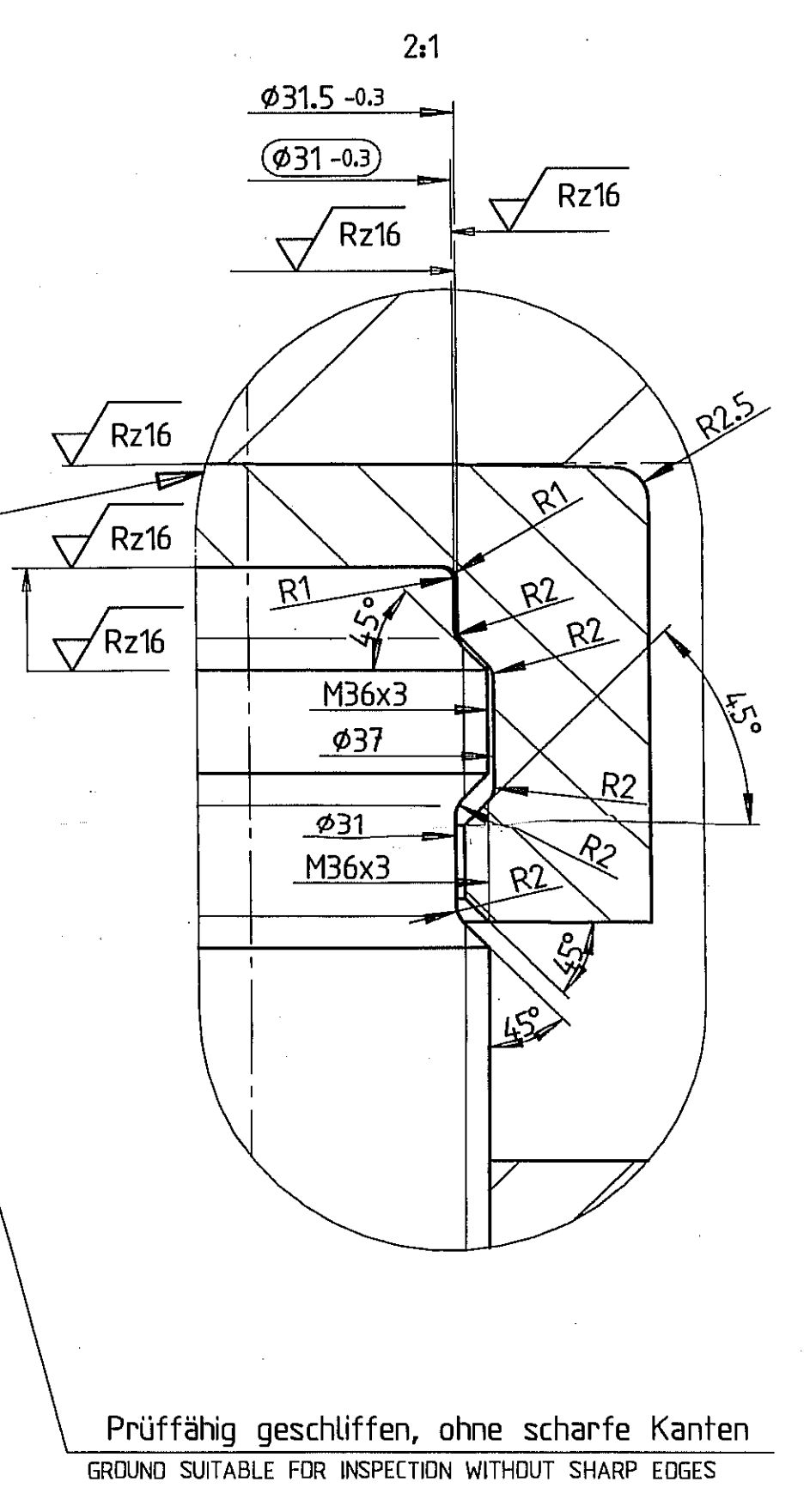
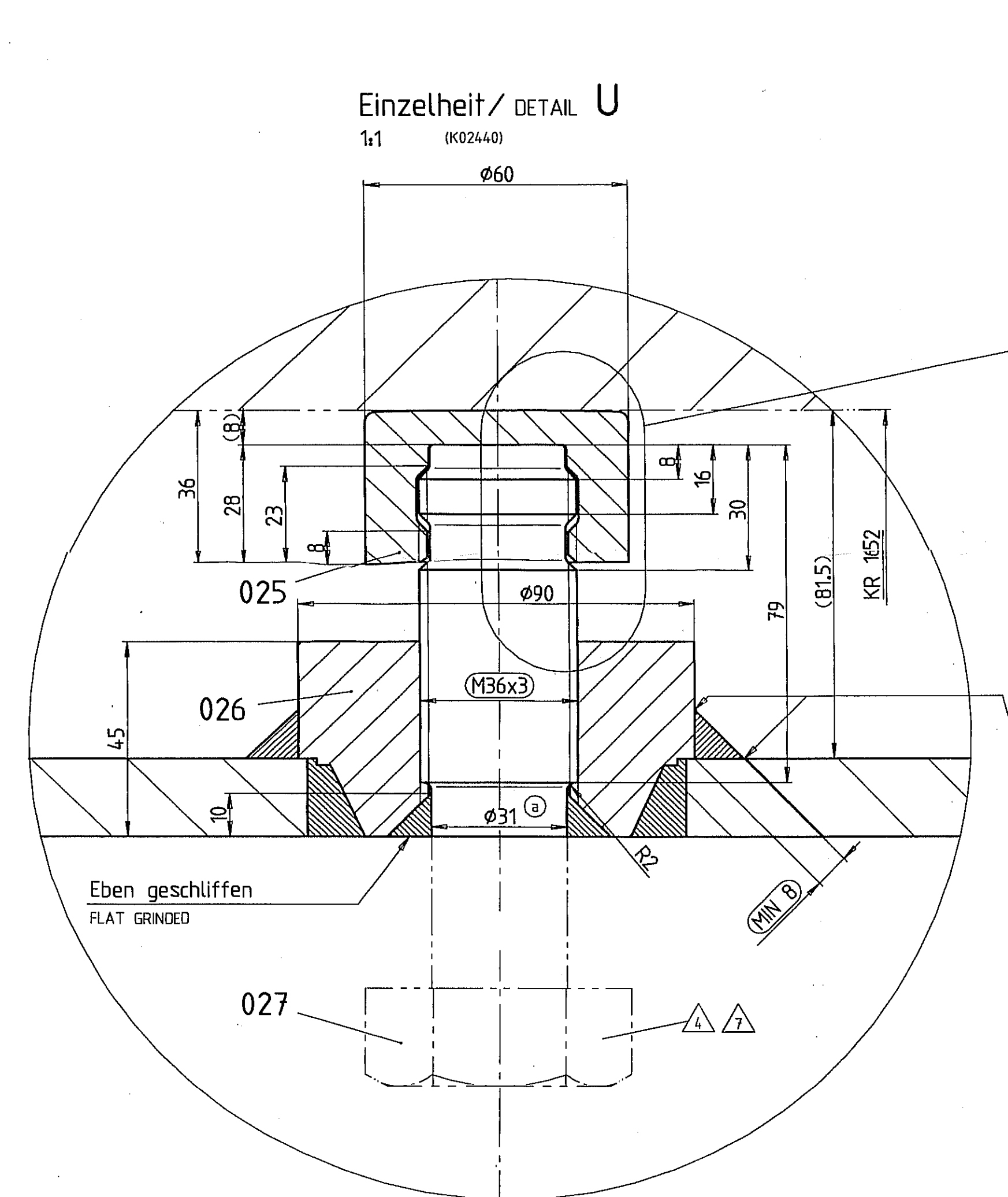
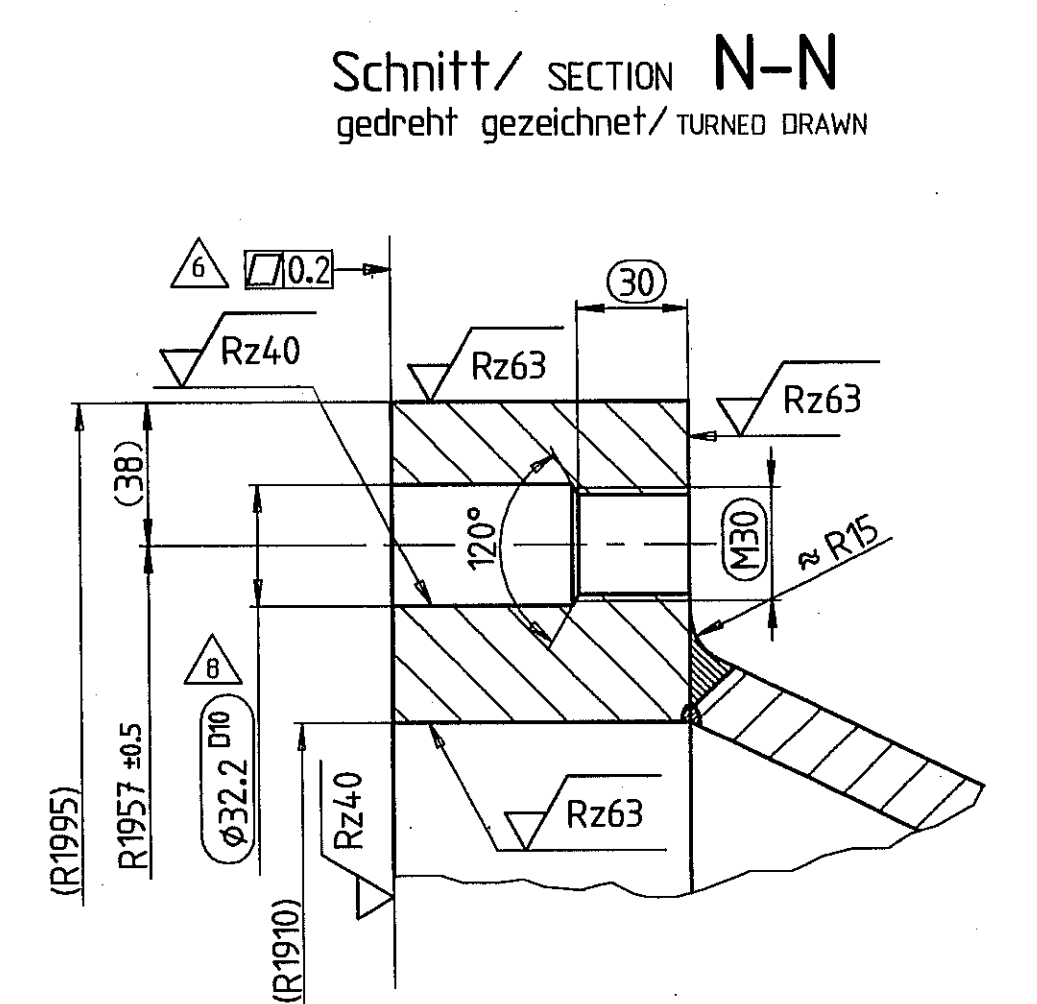
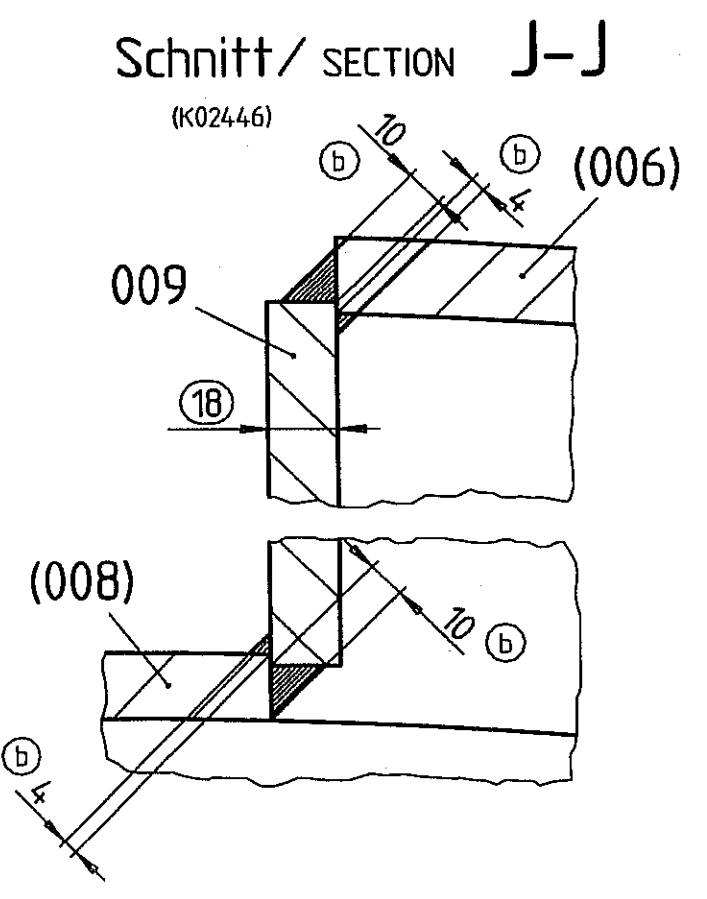
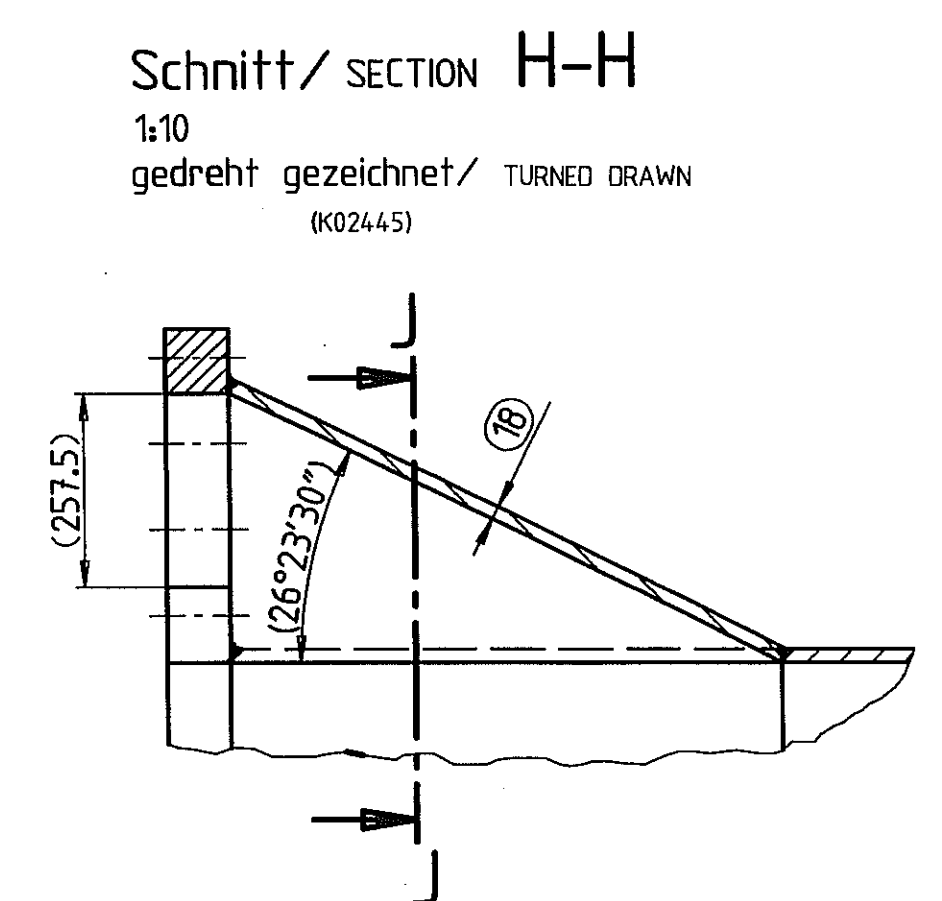
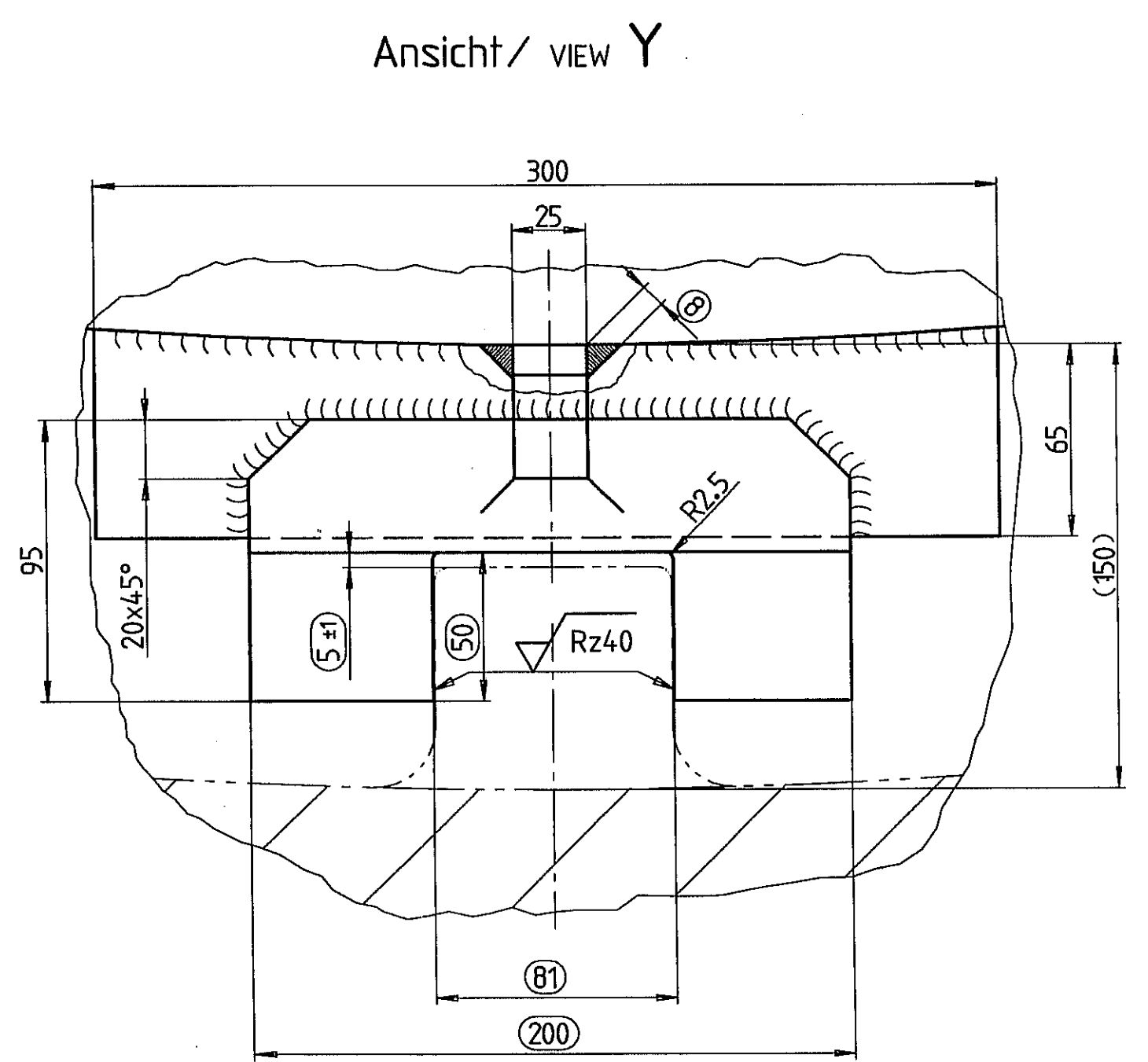
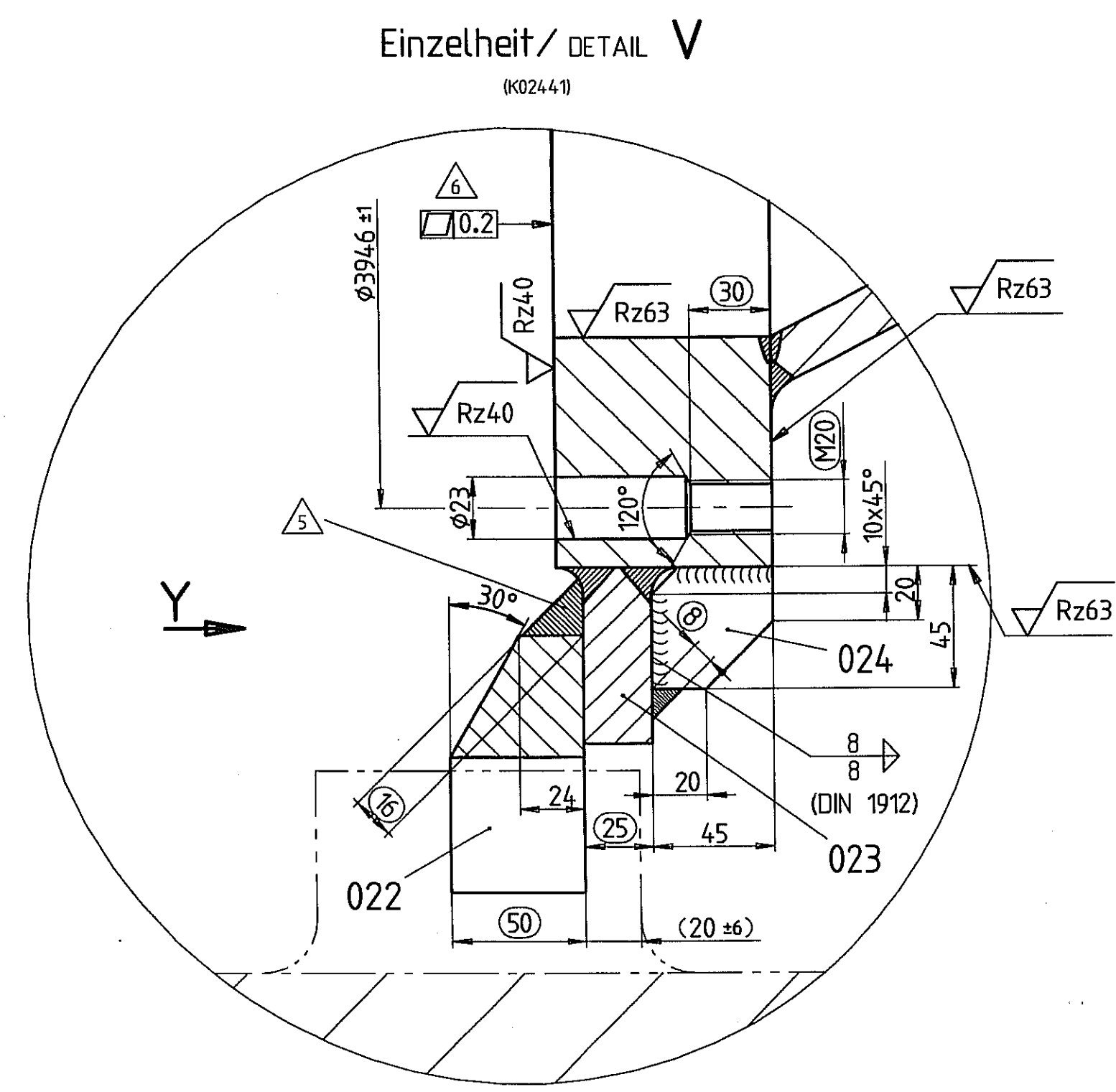
Anschluß siehe Zeichnung der BG 11 (Pos. 11.015 bis 11.020)
 CONNECTION SEE DRAWING OF SA 11 (POS. 11.015 UP TO 11.020)

Wird bei der Montage angepaßt
 ADJUSTED DURING ASSEMBLY

Eben mit innerer Manteloberfläche
 PLANE WITH INNER SURFACE OF SHELL

(30)

[illegible]



Bemerkungen siehe Zeichnung NDM2E-00-112750
NOTES SEE DRAWING NDM2E-00-112750
Hierzu / IN ADDITION TO THIS:
Zeichnung / DRAWING NDM2E-00-112750

~ (√Rz16 √Rz40 √Rz63)

Krsko Replacement Steam Generators
Revision b
dd 18.03.99

(LUECKEN/KRSKO-24.25.26/3624/2K74)
The recipient of this document is obliged to treat it in strict confidence. Reproduction of the document and/or translation thereof to third parties, as well as utilization or disclosure of the contents thereof, is strictly prohibited. All rights reserved, especially in case of a patent grant or registered invention (patent pending). Unless retention is mandatory, this document shall be irretrievably destroyed when it is no longer needed.
Der Empfänger dieser Unterlage ist verpflichtet, diese vertraulich zu behandeln. Weitergabe sowie Vervielfältigung dieser Unterlage, Vervielfältigung und Weitergabe ihres Inhalts, auch auszugsweise, nicht gestattet, soweit nicht schriftlich zugestanden. Alle Rechte vorbehalten, insbesondere für den Fall der Patenterteilung oder Erfindung. Nicht mehr benötigte Unterlagen sind zurechtzulegen zu vernichten, es sei denn, Empfänger hat Archivierungspflicht.

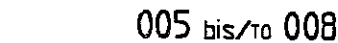
1. Ident. No.										Ursprung / Origin										Ursprung-Zeichnungs-Nr. / Origin drawing No.										Urspr.-Stück-Nr. / Orig. Part No.																													
Passmass										obere's interest										Project / Project										Krsko Replacement Steam Generators										SLO 001																			
TOLERANZEN										DIMENSION										Abmass										TOLERANZEN										DIMENSION										Abmass									
STANDARDIZATION, NO. CHANGED										STANDARDIZATION, NO. CHANGED										STANDARDIZATION, NO. CHANGED										STANDARDIZATION, NO. CHANGED										STANDARDIZATION, NO. CHANGED																			
WELDS ADJUSTED TO MANUFACTURER DRAWING										WELDS ADJUSTED TO MANUFACTURER DRAWING										WELDS ADJUSTED TO MANUFACTURER DRAWING										WELDS ADJUSTED TO MANUFACTURER DRAWING										WELDS ADJUSTED TO MANUFACTURER DRAWING																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS										SS										SS										SS																			
Date										Date										Date										Date										Date																			
SS										SS																																																	

(K01541)

(K01539)



(K01540)



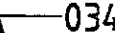
CONNECTION SEE DRAWING OF SUBASSEMBLY 11

The recipient of this document is obliged to treat it in strict confidence. Reproduction of this document and / or transmission thereof to third parties, as well as utilization or disclosure of the contents thereof, in whole or in part, are not permitted unless express authorization is given in writing. All rights reserved, especially in case of a patent grant or registered invention (patent pending). Unless retention is mandatory, this document shall be irretrievably destroyed when it is no longer needed.

Der Empfänger dieser Unterlage ist verpflichtet, diese vertraulich zu behandeln. Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts -auch auszugsweise- nicht gestattet, soweit nicht schriftlich zugestanden. Alle Rechte vorbehalten, insbesondere für den Fall der Patenterteilung oder GM-Entscheidung. Nicht mehr benötigte Unterlagen sind zu vernichten, es sei denn, Empfänger hat Archivierungspflicht.



(K01542



Fehlende Angaben nach Wahl des Herstellers in Abstimmung
mit Siemens Bereich Energieerzeugung (KWU)
MISSING DATA BY SELECTION OF THE MANUFACTURER IN ACCORDANCE
WITH SIEMENS POWER GENERATION GROUP (KWU)

Ständliste

TABLE 1.13 (continued)

3.2 (1.0 0.3)

NPF Consortium Framatome-Siemens

ASME Code requirements stated by

1. Ident. No.	Ursprung / Origin	Ursprung-Zeichnungs-Nr. / Original drawing No.	Urspr.-KW-Nr.
---------------	-------------------	--	---------------

Freigegeben von	Projekt /Project	KW-MR/PP Nr.
-----------------	------------------	--------------

Release Date	Krsko Replacement Steam Generators	SI 0 001
--------------	------------------------------------	----------

920516	NISKO Replacement Steam Generators	SLU 001
--------	------------------------------------	---------

Abing Dent	Datum Date	SS	Datum Date	Name Name	SS	Matr./Labo Matr./Labo	1.1 1.2 3.1		UA	YK
---------------	---------------	----	---------------	--------------	----	--------------------------	-------------	--	----	----

	Date		Date	Name	SSN	Scout	In	Out	ZT	Use Key: Alt
		07/03/06	07/03/06	1st Lt.	/8	Bennett, C.H.				

		Drawn	970306	LUCKEN	As	Continued 7/11/11	Printed 12/11/11
						Headlight bracket on DC15	Code

		bezahl. Erord.	970306	Lücken		Handlochverschraubung, BG 15	51.10.0
--	--	-------------------	--------	--------	---	------------------------------	---------

[illegible]

Checked	740310	070310	87	HANDHOLE SCREW CONNECTION, SA 15	DC 001
---------	--------	--------	----	----------------------------------	--------

DA NO	970515	KLING	BL 001
-------	--------	-------	--------

			Abt. Date	NOM2 470516 SG	Type: SG 72 W/D4-2	
--	--	--	--------------	---------------------------	--------------------	--

[illegible]

Altg. Toleranzen	Lonsortium	Zusammenfassung / Drawing Ref.	Revis. / Rev.
		NAME 11 112311	

GEN. TOLERANCES	Siemens AG/ Framatome S.A.	NUM 2E-11-112/41	-
-----------------	----------------------------	------------------	---

Spanen/CUTTING	Erreicht durch	Erreicht für
----------------	----------------	--------------

ISO 2768-m	Superseded by:	Supersedes:
------------	----------------	-------------

Schweißen / weissen	Ident.-Nr.:	3 493 550
---------------------	-------------	-----------

IDENT-104

Ø 4.5 H _B		+0.180	0	1. Ident. No.		Ursprung / Origin:		Ursprung-Zeichnungs-Nr. / Original drawing No.		Urspr.-KW-Nr.: Orsp. PP No.:	
Ø 4 h11		0	-0.075								
Paßmaß TOLERANCEO DIMENSION		oberes UPPER	unteres LOWER	Freigabedatum Release Date 970516		Projekt / Project: Krsko Replacement Steam Generators				KW-Nr./PP No.: SLO 001	
Abmaß ALLOWANCE				Abtgr. Dep't.		Datum Date	SS	Datum Date		Name Name	SS
								Maßstab Scale:		1:1; 2:1	
Rev. No.x		Release Date		Ident. No.		gezeichnet Drawn		970306		Nägels Nä	Benennung / Title: Stiftschraube und Mutter für Handloch STUD AND NUT FOR HANDHOLE Type: SG 72 W/D4-2
a 1		990727				bezeichnet Coord.		970306		Lücken Lü	
Change, Bemerkung an Pos. 023 geändert/ REMARK AT ITEM 023 CHANGE0						geprüft Checked		970515		Drossel Dr	
						QA NO		970515		Kleinert Kl	
						Abtgr. Dep't.		NDM2		970516	Ho
Date	SS	Dept.	Date	SS	Allg. Toleranzen GEN. TOLERANCES		Consortium Siemens AG/ Framatome S.A.		Zeichnungs-Nummer / Drawing No.		Index / Rev.
Prepared	990726	Lin			Spanen/ CUTTING ISO 2768-m		Ersetzt durch Superseded by:		NDM2E-22-112744		a
Coord.	990726	Lin			Schweißen/ WELDING		Ident-Nr.: Ident-No.:		Ersatz für Supersedes:		
Checked	990727	Lin									
DA	HILLE 990127	Vz									
Dep't. Man.	990727	Lin									