



AUDIT REPORT

<i>Company</i> Bopp & Reuther Sicherheits-und Regelarmaturen GmbH No: 00869208 Carl-Reuther Strasse 1 683 05 Mannheim		<i>Report Number</i> PR2011052ROAN <i>Our supplier code</i> DIV: 99	
<i>Product description</i> Design, manufacture, assembly and service of safety-, control- and stop-valves. As per enclosed ISO9001 certificate.		<i>Our product code</i> Type 5 Manufacturer	
<i>Audit criteria</i> ISO 9001, ISO 14001, Ringhals AB internal requirements for Supplier Evaluation (1754845) . IAEA GS-R-3 Vattenfall Code of conduct: YES.		<i>Class</i> 1-4	<i>Quality Manual number</i> Web-based
		<i>Audit date</i> 2011-07-12	
1 Audit Conclusion <input checked="" type="checkbox"/> The quality system is acceptable. <input checked="" type="checkbox"/> This report is valid until : 2014-07-12 - See below (3. Conditions): <input type="checkbox"/> Corrective actions are necessary. <i>Follow up Date:</i> <input type="checkbox"/> Re Audit is necessary.			
2. Brief summary An Audit of Bopp & Reuther Sicherheits-und Regelarmaturen GmbH was performed to evaluate their capability is in accordance with the requirements regarding nuclear activities. The conclusion of the team is that Bopp & Reuther Sicherheits-und Regelarmaturen GmbH has a well described and also implemented quality management system, the expected knowledge, capability and resources for involvement in customer specific projects.			
3. Conditions For future changes of the Company Quality manual and /or Certificates as well as overall changes in organization or ownership, please inform and send relevant information to Ringhals AB.			
<i>Audit team</i> Roger Andersson Torbjörn Nilsson		<i>Dept</i> RAB RAB RAB	<i>Sign</i> Klaus Hoffmann See more in general info (5)
		<i>Suppliers representatives</i> Quality Mgr	
<i>Distribution of this report</i> FKA, Forsmark OKG, Oskarsham SKB		<i>Date</i> 2011-07-14 Team Leader Roger Andersson, RZS 	
		<i>Approved by</i> Pierre Blomdahl, cRZS 	

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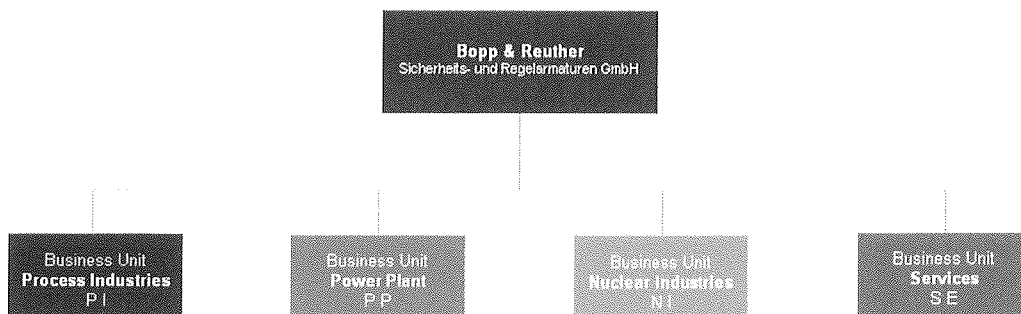
1. **Audit conclusion.**
2. **Brief summary.**
3. **Conditions.**
4. **Brief description of the supplier.**
5. **General about the audit.**
6. **Result from the audit, including description of findings and observations.**

4. BRIEF DESCRIPTION OF THE SUPPLIER.

The history of Bopp & Reuther Sicherheits-und Regelarmaturen GmbH started when the master fitter Carl Bopp and the engineer Carl Reuther founded the company in 1872 in Mannheim as a manufacturer of valves for measuring and metering.

The company is since 2006 privately owned and have also subsidiaries, C.H. Zikesch Armaturentechnik GmbH in Wesel, Germany and Bopp & Reuther GmbH-Austria in Vienna.

Bopp & Reuther Sicherheits-und Regelarmaturen GmbH operates in three key areas, process industries, conventional power plants and nuclear industries and they form four business units together with the service unit.



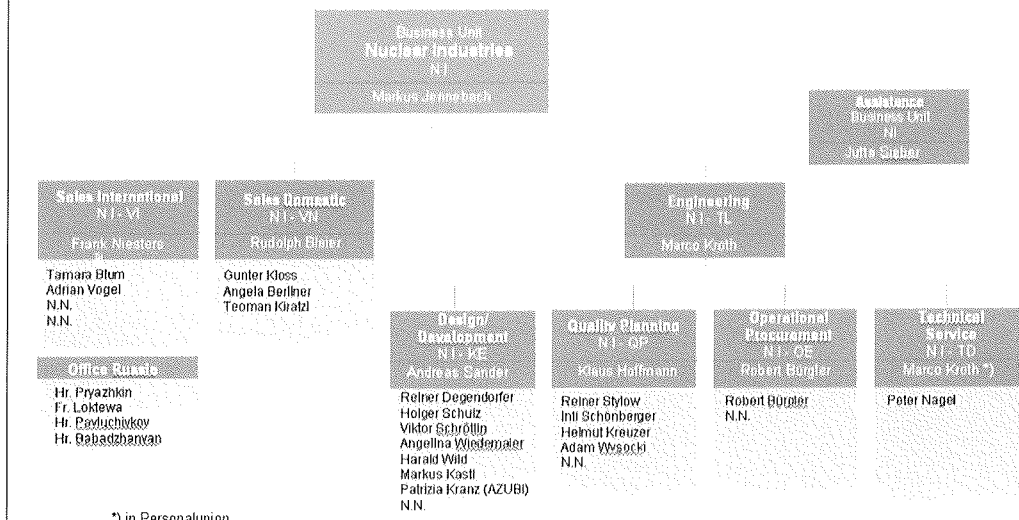
Business Units of Bopp & Reuther

Bopp & Reuther Sicherheits-und Regelarmaturen GmbH is a manufacturer of stop-, check-, control-, gate-, safety and special applications- valves. The also perform service and on-site repair of valves including machining and welding, e g valve-seat repair.

This audit covered the manufacturing plant in Mannheim, Germany. The company has been established in this area since the start 1872 and the old facilities are refurbished and modernized.

Approximately 300 employees are working in the facilities in Mannheim and about 30 employees are working within the nuclear industries unit.

Organisational Chart: Business Unit Nuclear Industries



The design, machining, welding, assembling, painting and testing are performed in Mannheim.

Bopp & Reuther Sicherheits-und Regelarmaturen GmbH has been a supplier to the nuclear industry for many years. They have supplied valves to many nuclear plant types such as PWR, BWR, EPR, CPR, AP, CANDU, VVER.









For details and more information please use the web site: www.bursr.com

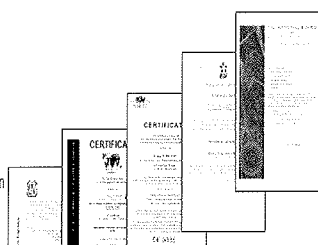
Certificate:

ISO 9001:2008, issued 2009-08-10 by TÜV SÜD Cert. No: 12 100 29422, Expiring date 2012-08-03
 AD 2000-Merkblatt HP0, HP100R und TRD 201 (DIN EN ISO 3834-2 und-3), 97/23 EG issued 2009-08-17 by TÜV SÜD Cert. No: IS-DDB-MAN-09-126, Expiring date 2012-09-30
 ASME Section I:V-Stamp, Section III NV-Stamp, Section VIII, Division 1 UV-Stamp.
 ASME N-Stamp, NPT-stamp for construction and fabrication with design responsibility of valves class 1,2 & 3.
 Sicherheits-Certifikat-Contractoren (SCC), issued 2009-07-30 by TÜV SÜD Cert. No: 12 106 29422 TMS, Expiring date 2012-07-21

Design Codes, Certifications, Approvals

Bopp & Reuther designs, manufactures and delivers in accordance with all relevant standards of the nuclear industry worldwide

Germany		ISO 9001, SCC, KTA 1401, IAEA-50-C-Q
USA		ASME III, NV / N / NPT-Stamp, ASME I + VIII, V + UV- Stamp, National Board Certificate of Authorization
France		EDF NT 85/114 cas 1, SGAQ 2004/04, QA System, RCC-M, AREVA NP, QN-100
Canada		TSSA Class 1, 2, 3 Certificates
China		Safety Quality License HAF 604
Russia		GOST, OTT 87
South Korea		KHNP Certificate of Registration
Hungary		NPP Paks Certificate of Registration



5. GENERAL ABOUT THE AUDIT

The audit was performed to evaluate the quality management system as per the certifications mentioned under the certification references. A checklist was used to evaluate the effectiveness in following the standard criteria of ISO9001, the company management system manual and the nuclear requirements applicable for the Swedish Nuclear industry.

A presentation of the company was given, including a review of the management system. A visit to the workshop and other applicable areas was the method for verification of the implementation of the quality management system.

A review of the quality system documentation gave the impression that there is a well-documented system, quality manual, process descriptions and instructions. It is the impression of the audit team that Bopp & Reuther Sicherheits-und Regelarmaturen GmbH has an effective QA-system

The workshop was found clean and functional for the assembling/manufacturing of products. Incoming inspection, machining, welding, measurement, assembly, painting, final inspection, testing and despatch are performed within their facilities.

Attendees:	Klaus Hoffman	Quality Manager / Welding Engineer
	Frank Niesters	Sales Manager
	Markus Jennebach	Head of Business Unit Nuclear-Industries
	Inti Schönberger	Quality planning
	Marco Kroth	Technical Manager
	Robert Bürgler	Purchase Business Unit Nuclear-Industries
Audit team.	Roger Andersson	Ringhals AB, Team Leader
	Torbjörn Nilsson	Ringhals AB, QC, Mech

6. RESULT FROM THE AUDIT.

The audit team impression is that implementation as well as commitment to quality is well understood by the employees met during the audit.

Some examples from areas included in the scope of the audit:

- Policies:
 - Quality Policy
 - Environmental Policy
 - Personnel Policy

- Overview of Management Manual and the connections to corresponding requirements in:
 - ISO 9001
 - SCC
 - AD 2000 (EN 3834-2)
 - National Board
 - ASME III, NV / N / NPT-Stamp, ASME I + VIII, V + UV- Stamp,
 - PED 97/23

- Analyse of the processes and the organisation of the Bopp & Reuther Sicherheits-und Regelarmaturen GmbH.
 - Well-defined responsibilities.
 - Routines for control and monitoring of non-conforming products and deviations exists.
 - Training/competence database “TrainMan” for all employees, updated in yearly appraisals. E.g. all personnel within the nuclear industry unit have training in ASME III code with written tests after completed training.
 - Introduction programme for new employees exists.
 - Routines for approval and audits of critical nuclear suppliers exist.
 - In the business system there is an approved supplier list available.
 - They have routines and are experienced to work with design according to ASME programs for e.g. calculations and requirements in nuclear applications
 - The company has a education centre located in the facilities for future recruitments and they have cooperation with technical universities.
 - Research and development with e.g. FEM analysis, strength and seismic calculations, Stress model and flow model simulation.

- Evaluation of specific documentation:
 - Procedure and routines for handling of control documentation, inspection and testing record related to customer specific needs exists
 - Quality plans are presented to the customer, routines for handling of revised and approved versions exists

- Welding, routines and documentation:
 - ASME Code welding are performed and qualified in accordance with the requirements of ASME and controlled by the responsible welding engineer.
 - WPQR and WPS are approved and certified by TÜV SÜD.
 - Welders are approved and certified by TÜV SÜD
 - TÜV SÜD is the accredited company (17020) and is permanently located and available within the production facility.
 - For heat treatment they have annealing furnaces (electronically controlled, annealing process recorded with annealing charts), induction and gas furnaces.

- Non Destructive Examination NDE:
 - Bopp & Reuther Sicherheits-und Regelarmaturen GmbH has routines for review and approval of NDE procedures and personnel.
 - Bopp & Reuther Sicherheits-und Regelarmaturen GmbH have NDE qualified personnel, level 2 and 3 according to EN 473 and ASNT/TC1A.
 - Applus RTD is accredited (17025) and is permanently located and available within the production facility.
 - They perform radiographic, dye penetrant, ultrasonic, magnetic particle testing, hardness testing

- Workshop tour, test facilities including interviews within the visited areas.
 - Activities such as incoming inspection of material are controlled and released by their QC before use in the production.
 - Measurement, machining, welding, painting, assembly, final inspection, testing and despatch are performed within the Bopp & Reuther Sicherheits-und Regelarmaturen GmbH workshop.
 - Routines for calibration exists, 3 master gauges are calibrated by an accredited laboratory (Deutscher Kalibrierdienst-DKD) according to ISO/IEC 17025
 - They have procedures for assembly, test records and control documentation related to customer specific needs.
 - Bopp & Reuther Sicherheits-und Regelarmaturen GmbH has a designated test facility where they perform prototype and product testing in accordance with international standards, internal and customer procedures e.g. shell pressure and tightness testing with air and water, helium leakage testing, vibration damper testing, set pressure testing under operating conditions, flow coefficient measurement for safety and control valves
 - Test benches for safety valves with air pmax 400 bar, water pmax 680 bar, steam pmax 240 bar, Tmax = 540° C
 - High pressure test bench for strength testing, Fmax 3000 kN
 - High pressure test facility for control valves, water, pmax 160 bar
 - High pressure test facility for function, flow rate, back pressure and simulation measuring air pmax 130 bar, water pmax 320 bar

All valves are submitted to a functional test prior to dispatch.

Bopp & Reuther Sicherheits-und Regelarmaturen GmbH has well-customized facilities. The orderliness and housekeeping is good and according to the audit team.

The audit did not result in any findings or observations.

Taken together the audit team got a positive impression of the company and that Bopp & Reuther Sicherheits-und Regelarmaturen GmbH is an experienced as well as a qualified company for nuclear application products.

The review of the Quality Management System resulted in an approval for Bopp & Reuther Sicherheits-und Regelarmaturen GmbH, Mannheim, Germany as a supplier type 5 (manufacturer incl. service of their products), valid for 3 years.

This audit report is also available and will be sent to the other Nuclear Power Plants (Oskarshamn and Forsmark) in Sweden.

2011-07-15

Roger Andersson RZS

Bopp & Reuther Sicherheits-
und Regelarmaturen GmbH
Att: **Klaus Hoffman**
Carl-Reuther Strasse 1
D-683 05 Mannheim
Germany

AUDIT REPORT

Enclosed please find our audit report PR2011052ROAN.

Our reference is Roger Andersson RZS.

We also would like to thank you for the hospitality and the open minded discussions during the audit.

Best regards,

Ringhals AB
RZS Supplier Development

Roger Andersson
Lead Auditor

RINGHALS AB

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