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PLANT UPGRADES

GRIPPER AIR CYLINDER/LIFT PLATE UPGRADE
Reduce Maintenance, Enhance Safety

Replacing old-style gripper air cylinders can take up to eight hours. AREVA, through Stearns Roger® Services (SRS) offers a cost effective upgrade to reduce maintenance time and enhance personnel safety when performing gripper air cylinder maintenance or replacement.

Design Change Simplifies Replacement Process

SRS has eliminated the headaches associated with removing the mounting frame prior to inspections. We’ve crafted a simple design change to significantly reduce cylinder replacement time (mostly under two hours) regardless of your original equipment manufacturer.

Eliminate Intensive Labour and Safety Concerns

AREVA will work with you to help deliver safe, economical power to the grid more efficiently. Our responsive teams understand how to maximize key resources, while protecting the surrounding environment. The result? As a global nuclear energy leader, we can deliver innovation that gets the job done right. Our new cylinder mounting frame and access plate allow you to replace and maintain the gripper air cylinder without the intensive labour and safety concerns associated with removing the main hoist cable and supporting the inner mast.

Following this upgrade, you can use standard hand tools to perform work with the inner mast in the full up position – all without disconnecting the hoist cable.
Reactor Services

Equipment Supplied

- One air cylinder mounting frame with self-locking mounting hardware
- Air cylinder assembly
- Two new micro limit switches (Gripper Engaged/Disengaged Indication, LS-1/LS-2) with mounting hardware
- One electric cable assembly
- Miscellaneous mounting hardware, as required, to reinstall existing components

Documentation Supplied

- Revised mechanical assembly drawings as required
- Upgrade installation and testing procedures
- Technical manual update data sheets

The gripper air cylinder modification ensures short maintenance times and increases personnel safety.
TECHNOLOGICALLY SUPERIOR PRESSURIZER HEATERS
The Solution for Enhanced Performance

AREVA and Thermocoax have teamed to provide technologically superior pressurizer heaters. Their enhanced design features Thermocoax’s extensive mineral-insulated cable and heater manufacturing experience. AREVA has the manufacturing, nuclear engineering and ASME Code design experience that are second to none.

Superior Heat Transfer and Durability

Our heaters have exceptional heat transfer characteristics. Our design features a heating element wound helically on a copper core, ensuring uniform heating along the length of the heater. The entire assembly is inserted into a stainless steel sheath and swaged to ensure outstanding thermal transfer and durability. The heaters employ a thinner layer of insulation, which in turn increases thermal conductivity.

This compact insulation is rated to withstand heat flow as high as 100 W cm\(^2\) with outstanding integrity, easily accommodating the system’s maximum heat flow of 50 W cm\(^2\). The heaters are more efficient because they reduce the temperature difference between the resistance wire and the external tubing. Computer analysis shows a temperature variation between the resistance wire and the external tube of less than 250°C for a specific power of 40 W cm\(^2\) – as much as 66% less variation than conventional systems.

Increased Reliability and Integrity

Our heaters provide increased reliability compared to conventional pressurizer heaters. When subjected to demanding aging tests that simulate temperature, vibration, and radiation stresses over a 20-year lifespan, as well as seismic tests and loss of coolant...
accident (LOCA) tests, these pressurizer heaters suffered no failures. Thermocoax has more than 4,000 heaters in service outside North America. AREVA has manufactured more than 1,000 ASME Code heaters with no pressure boundary failures. Moreover, our heaters are designed, welded, inspected and NPT-stamped under AREVA’s ASME Code Program and constructed of high-quality materials in Thermocoax’s ISO-certified manufacturing facility.

How do you achieve superior durability? We add a special, thermally-treated outer stainless steel sheath and a second sheath over the heating element which provides two barriers between the primary system and the mineral insulation.

**Technical Design Features and Options**

- Available as single- or three-phase with power ratings from 12.5 kW to 50 kW
- Connector configurations available to accommodate existing plant cabling
- Optional engineering support can help you implement design changes or welding services for field installation of replacement pressurizer heaters
- Applicable for all PWR designs
- Can be designed and manufactured as replacements for installed heaters – with the same electrical and mechanical interface
- Can be provided as part of a plant upgrade or pressurizer replacement
PERMANENT CANAL SEAL PLATE (PCSP) Improve Plant Performance

AREVA’s Permanent Canal Seal Plate (PCSP) eliminates the potential for canal seal leakage associated with temporary seals. PCSPs also reduce outage schedule and enhance personnel safety. PCSP enhances personnel safety by:

- Eliminating handling of temporary canal seal
- Eliminating open areas between the vessel and canal floor when canal seal is not installed

PCSP improves human performance defenses by:

- Reducing the need for recovery plans and outage plan interruptions experienced when a canal seal leaks
- Simplifying processes

PCSP simplifies the process by:

- Reducing the complexity of an outage activity
- Removing a task requiring technical expertise
- Eliminating adhesive application and removal
- Reducing the amount of fasteners and FME risk

Each PCSP is permanently installed over the annulus area between the reactor vessel and the canal floor to eliminate the risk and schedule issues realized during a canal seal plate leak.
PCSPs also reduce outage schedule and enhances personnel safety by:

- Providing outage schedule predictability
- Eliminating Polar Crane picks for temporary seal plate installation and removal
- Eliminating temporary canal seal installation and testing
- Allowing earlier stud removal setup
- Allowing parallel RV Head removal activities

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<th>Plant Benefits</th>
<th>PCSP Features</th>
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<tr>
<td>Outage Delays due to canal seal leaks can equal 1% loss in operating profit</td>
<td>Predictable outage durations</td>
<td>Permanent refuel canal seal between vessel and canal floor</td>
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<td>Eliminates variables/eliminates latent design issue. Estimated recovery cost of $200,000 per event</td>
<td>Improved risk mitigation and human performance</td>
<td>Design eliminates high potential leak path</td>
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<td>Reduces potential for $20,000 cost per recordable injury</td>
<td>Nuclear and industrial safety enhancement</td>
<td>Prevents RCS leakage from being masked by canal seal leaks</td>
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New design is easy to maintain

Eliminates pinch points, cables, rigging, and sealant application

RV inspections do not require neutron shielding removal

Eliminates probability of canal seal failure during fuel handling
Options

AREVA's flexible design enables you to select the optimal modification for your specific plant needs.

Permanent Canal Seal Plate with Neutron Shielding and Access Ports

This option allows you to eliminate an existing barrier to safely access upper areas of the reactor pressure vessel. Most current shielding designs are complicated and dangerous to remove / replace. Our neutron shielding option provides safe, simple access to these areas as required for inspection and maintenance.

Permanent Canal Seal Plate without Neutron Shielding

This is the lowest cost option. Utilities will realize the benefits of a PCSP, but may lose access to upper areas of the reactor pressure vessel.

Experience Matters

AREVA has performed 12 PCSP projects since 1993 including:

- Beaver Valley 1 and 2
- Palo Verde 1, 2 and 3
- Arkansas Nuclear One 1 and 2
- Crystal River 3
- Three Mile Island
- Davis-Besse
- Millstone 1 and 2
Our PCSP expertise will provide you with the best possible solution
COMPONENT REPAIR AND REPLACEMENT

We Listen. We Learn. We Innovate.

As utilities pursue plant life extension, AREVA is bringing decades of component repair and replacement experience to deliver new solutions for degradation of plant components. We are listening to your specific needs, learning how to best meet those needs, and applying innovation to both technology and performance. It’s all to provide the confidence you deserve for success in the 21st century.

**Reactor Vessel Head Nozzle Modifications**

AREVA’s responsive, experienced teams (as recently as 2010) successfully modified control rod drive nozzles for one of our customers, allowing the plant to resume safe and reliable operations. In the middle of a busy outage season, AREVA organized and trained teams of more than 100 people and deployed them to the site. Inspections revealed a total of 24 nozzles needing modification. AREVA’s process included removal of the lower half of each affected nozzle, re-welding, inspecting and testing the remaining section to ensure each nozzle met and exceeded the requirements for structural integrity. The job was completed with no safety incidents and below the project radiological dose goals, while minimizing the impact to outage critical path duration. Since December 2000, AREVA has repaired nearly 90 percent (over 130) of all U.S. RV Closure Head nozzles.
As identified (with more examples to follow), AREVA has substantial experience working on Pressurized Water Reactors and Boiling Water Reactors and their associated components. These innovative technologies, developed to reduce outage and dose, are completely transferable to CANDU stations and associated components. Dose intensive programs such as SFCR, Steam Generator Nozzle repair/install, feeder repair, Steam Generator replacement or liquid nozzle repairs would all be CANDU maintenance and upgrade systems that could utilize the knowledge and experience currently in-house at AREVA.
Dual Wire High-Deposition Welding

In addition to reactor vessel closure head nozzles, other locations susceptible to corrosion, such as dissimilar metal weld configurations on Pressurizer Surge Nozzles, Reactor Coolant Pumps (RCP Inlet/Outlet nozzles), Reactor Vessel Primary Nozzles and PWR or BWR large-bore piping. To help reduce exposure and outage schedule time, AREVA has developed and proven a high-deposition gas tungsten arc weld (GTAW) technique for robust, field-hardened welding. This advanced welding technique demonstrates dramatic increases in field deposition rates. In fact, rates have approached two-to-three pounds per hour. This process was recently utilized in the successful weld overlay of a Pressurizer Surge Nozzle in Belgium.

CRD Housing Repair Development and Qualification

AREVA’s Control Rod Drive (CRD) Housing repair handles high-tensile stresses through innovative weld joint design. Internal Access Weld Repair replaces the load-carrying capability of the CRD housing-to stub tube J-weld, and provides a seal to prevent leakage from the RV.

AREVA offers three basic repair designs: the standard BWRVIP-58 repair, a modified BWRVIP-58 repair based on Code Case N-638, and complete CRD Housing Replacement. Repair design optimizes schedule and dose considerations for implementing the permanent repair.
Mini-ID Temper Bead Welding for Bottom-Mounted Nozzles

Nearly 60 U.S. plants have the potential for Primary Water Stress Corrosion Cracking (PWSCC) on their Reactor Vessel (RV) Bottom-Mounted Nozzles (BMNs). When plants age, the likelihood of PWSCC occurring in a Dissimilar Metal (DM) weld increases substantially. AREVA’s mini-ID Temper Bead (IDTB) welding techniques can eliminate all Alloy 600 from service and implement a permanent solution for continued BMN integrity.

We can perform mini-IDTB weld mitigation of the BMNs with the RV in the flooded condition, reducing radiation exposure and impact to your outage schedule. This is an adaptation of our IDTB CRDM Repair tooling — successfully proven with extensive experience.

Steam Generator Replacement

AREVA continues improving its Steam Generator Replacement (SGR) experience by taking an already successful legacy and meeting challenges head-on to achieve greater milestones in the 21st century.

The CRandR team’s recent SGR outage set the standard. Lessons learned and implemented from previous outages enabled the team to meet or exceed every goal. Breaker-
to-breaker outage activities were 11 hours and 40 minutes ahead of baseline schedule and ahead of the industry average of 69 days. Precise fitups deliver more accurate welding parameter duplication, reducing weld time and risk for defects. All eight of the Primary RCS welds, using the Machine Narrow Groove GTAW process were defect-free on their final RT. None of the welds received informational RTs, and 29 secondary welds were completed by the manual GTAW / SMAW process, during both the pre-outage and outage. The project was completed with ZERO safety or human performance issues.

**Reactor Vessel Head Replacement**

We tailor Reactor Vessel Closure Head (RVCH) installation services for each customer’s plant configuration. AREVA has performed over 70 RVCH replacement projects globally through December 2010, including BandW, CE and Westinghouse two-, three- and four-loop plants.

AREVA’s depth of experience in developing, refining and qualifying the Control Rod Drive Mechanism (CRDM) installation process has created the world’s most reliable CRDM replacement program. Our optional Integrated Latch Housing design (no leaks in more than 5,300 installations) eliminates the lower canopy seal.
Reactor Services

We set a world record for the shortest outage duration at a RVCH replacement at the Salem Nuclear Power Plant. Dick Labott, Project Manager, Salem Unit One and Unit Two RV Head Replacements, praised the AREVA team. “On Sunday, November 6, 2005, the Salem 1 breaker was closed at 0103 hours, concluding the world’s best reactor head replacement. Total duration was 25 days, 6 hours – second to none. Your leadership through both 2005 reactor head replacements contributed to the two best and shortest Salem refueling outages ever.”

Integrated Head Assembly

Integrated Head Assemblies (IHA), fabricated and installed by AREVA, are customized designs for Westinghouse, Combustion Engineering (CE), or BandW designs. Plants have realized outage reductions of up to six critical path days, as well as dose reductions of three-to-four person REM per outage. In addition, the highly safe design reduces the potential for personnel injury, while promoting ZERO OSHA recordables. The AREVA IHA includes features that eliminate most of the polar crane picks, leading to far fewer critical path operations. Shielded access doors around the lower shroud allow for open inspection access to both RVCH and CRDM penetrations. This enables you to compress outage schedules and get your plant reconnected to the grid in a shorter period of time.
Baffle Bolts

AREVA recently performed the first U.S. nuclear plant Baffle Bolt NDE inspection under new Materials Reliability Program (MRP-227) guidelines for Pressurized Water Reactor Internals Inspection and Evaluation. AREVA completed the record exam of 1,088 bolts 17 hours ahead of schedule. The project was completed under the exposure estimate with zero foreign material exclusion (FME) incidents.

Worldwide, AREVA has removed or replaced more than 8,700 core barrel and baffle-to-former bolts to date. An additional benefit is that AREVA can perform inspections in parallel with bolt replacement activities, further minimizing outage time.

Metrology for Component Replacement Support

AREVA can apply its advanced metrology processes to component replacements, piping and/or design modifications as well as other complex measurement challenges. AREVA’s in-house training program and diverse measurement tools ensure precision component and piping fitups for plants of all types. AREVA Metrology teams have supported over 50 SGRs. But it doesn’t stop there. The teams have also performed pipe modifications, fibre insulation replacement and FAC projects, helping numerous sites mitigate risks, cut costs, save schedule time, predict fitups, and forecast unforeseen issues to support the overall success of their projects.
AEGIS INLAY<sup>SM</sup> PROGRAM
Comprehensive Repair Technology for PWSCC

To provide a more comprehensive repair technology, AREVA has initiated a new solution for Reactor Vessel Primary Nozzle Inlays (RVPNI). Our innovative Aegis Inlay<sup>SM</sup> Program combined with the most responsive teams in the industry, get the job done right. AREVA is working on this program, while investing substantially to design a Flooded Cavity Delivery System (FCDS) that delivers robotic tooling to primary nozzles for inlay operations. The FCDS design provides a platform that enables RVPNI on multiple nozzles in parallel while reducing radiation exposure. It’s all accomplished while maintaining the reactor vessel internals underwater and controlling the inlay operations from a safe, low-dose location.

The Right Processes for a Growing Trend

Thirty-one PWR plants in the United States and fifteen PWR European plants have the potential for Primary Water Stress Corrosion Cracking (PWSCC) on Reactor Vessel (RV) primary nozzles. The Dissimilar Metal (DM) weld configurations on both hot and cold leg primary nozzles are susceptible at these plants.

As the plants age, the likelihood of PWSCC occurring in a DM weld increases. Presently several mitigation technologies exist including weld inlay, full structural weld overlay, stress improvement (Mechanical Stress Improvement Process – MSIPSM, non-structural or preemptive weld overlay, etc.), and spool-piece replacement. Each of these technologies has been proven successful for a reactor vessel nozzle or comparable location.
No Inspection Beyond Your 10-Year ISI Schedule

As outlined in MRP-139, these welds require increased inspection frequency unless corrective action is taken. Weld inlay of the DM weld area isolates the PWSCC susceptible material from the primary environment, changing the weldment to Category A, as defined by MRP-139, and returning the component to the current 10-year ISI frequency. Weld inlay, full structural weld overlay and spool-piece replacement are the only technologies that address all flaw scenarios in the DM weld area. The weld inlay and spool-piece replacement require no additional inspection beyond the existing 10-year ISI schedule. Full structural weld overlay and spool-piece replacement would have significant impact on site outage schedule and dose.

The bottom line? With our Aegis InlaySM Program, you can minimize schedule impact and radiation exposure for weld repairs and return your nozzle to the maximum allowable inspection frequency.
ECLIPSE
Reliable, Precise CRGT Inspection and Measurement

Based on more than 20 years of study, AREVA’s patented ECLIPSE technology demonstrates our commitment to precisely measure and inspect wear on Control Rod Guide Tubes (CRGTs). CRGTs ensure that Rod Cluster Control Assemblies (RCCAs) drop correctly. By guiding the RCCA through its step-by-step movement, controlling both power and temperature, the CRGT design avoids interference between RCCA vanes and the guiding device (CRGT cards). ECLIPSE comes from the same teams who employed Ion-Nitrided RCCAs – proven to efficiently prevent wear after 15 years of operation. Combined with our proven wear database and industry knowledge base, and RandD, ECLIPSE also enhances wear phenomena modelization in parallel to wear experiments already in progress at AREVA’s testing facilities.

Efficient Process

Why is it different? ECLIPSE employs shadowgraph technology. The tool is housed in a unique spider equipped with three cameras that examine three plate holes (two outer, one inner) simultaneously. By turning the device 90° around its vertical axis, we can optically measure three additional holes. We then post-treat the images to determine CRGT wear profile and numerical characteristics.
Protect Your Outage Schedule

AREVA can perform the inspection either when the upper internals are on the stand or when removing the CRGTs individually for maintenance. We diagnose the CRGT immediately following each measurement. Your benefit? Our inspection helps protect your outage schedule.

Primary Technical Causes of Wear

AREVA's focussed studies on extensive CRGT wear risks help identify industrial wear criteria.

Wear by Translation (friction type)
- Differential pressure during continuous guidance forces RCCA contact with the CRGT, inducing wear and sticking during the vertical motion of the RCCA.

Wear by Vibration (impact/sliding type)
- Vibrating sources are located both at the exit of continuous guidance and at the CRGT cover plate. As wear increases the diameter of the CRGT hole, the RCCA finger is not guided correctly. In such cases, interference between the RCCA spider vanes and the CRGT may occur during step-by-step movements or when the RCCA drops.
HIGH DEPOSITION WELDING SOLUTIONS
An Innovative Welding Approach

AREVA has a history of developing innovative technologies that meet the industry’s increasing demand for materials degradation solutions, while satisfying customer needs and maintaining a reputation for high quality services and products. Our advanced high deposition welding system addresses the need for increased filler metal deposition rates for large diameter weld overlay projects. These include Reactor Vessel Primary Nozzles and additional susceptible Dissimilar Metal Weld configurations on steam generator (SG) and reactor coolant pump (RCP) inlet and outlet nozzles.

Reliably and Efficiently Solving Your Welding Challenges

As the industry moves into the next phase of Alloy 600 mitigation, solutions have been developed for implementation to support our customers’ goals, which focus on life-of-plant reliability and efficient outage execution. Existing welding approaches did not match up to the challenge due to low weld filler deposition rates that resulted in extended schedules and increased labour cost. By utilizing AREVA’s optimal high deposition welding solution, our customers will realize the benefits of reduced schedule impacts and minimized crew sizes, while avoiding conflicts with parallel work activities.

High Quality Welds Equal Increased Efficiency

AREVA has completed an exhaustive, multi-year international development program to adapt proven, high deposition Gas Tungsten Arc Weld (GTAW) techniques to our robust, field-hardened welding front-end designs. Production tooling qualification, currently in progress, has proven that these advanced welding techniques (which utilize a dual hot/cold wire) significantly increase real-time deposition rates. To further optimize the solution, AREVA utilizes dual weld heads on each weld track which features this advanced
process. The front-end design is based on tooling that has been used extensively on weld overlay tasks implemented at PWR and BWR units, as well as narrow groove welding of large-diameter primary piping. Take advantage of our field proven design and approach and highly skilled technicians during your next outage. Be confident in the knowledge that AREVA will provide a clear path to high-quality welds at improved deposition rates, contributing significantly to your overall project success.
WELDING ENGINEERING AND SERVICES
Your Premier Supplier for Welding Systems and Qualified Procedures

AREVA’s broad selection of welding systems and services provides the technology and skills to meet your most demanding materials management challenges. We have significant advanced technology and experience in the design, fabrication, repair and inspection of nuclear power plant components and equipment — ranging from reactor vessels, steam generators, pressurizers, reactor coolant piping, supports and restraints to the smallest pressure boundary items. We offer complete services ranging from manual welding to remote-controlled operations, even for the most difficult welding applications. Our inventory of weld procedures and qualifications enables us to deploy rapidly and perform responsive, safe repairs in emergencies.

Procedures and Processes for Your Specific Needs

Our welding procedures include various ambient temperature and conventional temper bead methods, pipe weld overlays, hyperbaric chamber GTAW and GTAW narrow groove welding. In fact, we were the first to perform ambient temperature temper bead overlay at a U.S. plant in 1997. In addition, our diversified portfolio of ASME Section III/XI-qualified welding processes includes SMAW, manual and automated GTAW, PAW, GMAW and FCAW. Moreover, we hold “N” and “NPT” ASME Certificates of Authorization and the “NR” National Board Certificate of Authorization. These certificates, combined with our knowledgeable and experienced personnel, ensure a better and more efficient working relationship with our customers, with rapid and accurate solutions to repair and modify design challenges.

Advanced Repair Technology Saves Time, Enhances Reliability

Our innovative equipment and processes enable us to repair multiple penetrations
simultaneously, reducing valuable schedule time and radiation exposure. These processes are applicable to all PWR designs and readily adaptable to meet specific needs at your CANDU plant.

Our repair approach is qualified to the ASME Code and 10CFR50 Appendix B to ensure reliability.

**Quality Assurance**


The CSA B51 and ASME B31.1 and B31.3 Quality System is documented in the Quality Control Manual 56-5058327.

AREVA Canada has the following TSSA certified programs:

- Construction of class 1, 2, 3 and 4 Parts, Components, Supports, Fittings and Piping, Repairs and Alterations, Shop assembly and Field site and as Metallic Material Organization, in accordance with CSA Standard N285.0, General requirements for Pressure retaining Systems and Components in CANDU Nuclear Power Plants – QA 02105.
- Construction of Class 1, 2, 3 and 4 Welded and Non-welded Category A, B, C, D, E and H Fittings in accordance with CSA Standard N285.0 – QA 02106.
- Design, Fabrication, Field Assembly and Erection of Piping Systems in accordance with CSA-B51, ASME B31.1 Power Piping and ASME B31.3 Process Piping Codes – QA
Reactor Services

01167 and QA 01168
- Repairs and Alteration of Boilers and Pressure Vessels, Piping and Fittings in accordance with CSA-B51, The National Board Inspection Code and Original Codes of Construction – QA 01166
- Fabrication of welded and non-welded Category A, B, C, D, E and H type fittings in accordance with CSA B51, Boiler, Pressure Vessels and Pressure Piping Code - QA 03287

AREVA Canada is a holder of ISO 9001 certificate as well – QMI CERT-0033825.

An extensive Gap Analysis, which compared the AREVA Canada’s QA Programs to the N285.0 and applicable CSA/CAN N286 Standards including CSA/CAN-Z299.1, was performed with no exceptions identified.

COG/CANPAC audited AREVA Canada’s office in Pickering on February 2009 against the requirements of CSA Z299.1, N286.1, N286.2-00, and N286.3. This audit was conducted on behalf of OPG, Bruce Power and Hydro Quebec and all the findings have been closed.

AREVA Canada has a Certificate of Authorization for Professional Engineers Ontario for design engineering work in Ontario # 11580307.
Full Scale Mock-up Capabilities

We have the necessary facilities to perform equipment development, qualification and training on full-scale mockups. In fact, our exclusive Technical Training Centre features full-scale pressurizer and upper reactor vessel head mockups to train welders and welding operators prior to site deployment for modifications and repairs to nozzle penetrations.

We also feature a full-scale mockup of a lower reactor vessel head for personnel training and innovative tool development for bottom-mounted instrumentation nozzle repairs and modifications. We have the facilities to perform this qualification and training with contaminated equipment.

Decades of Experience

Our staff includes welding, mechanical and electrical engineers, and other field-proven technical personnel, some with more than 30 years of experience in the nuclear power plant component service industry. Our focus on responsiveness means we are there when you need us. That’s your assurance of advanced technology and expertise delivered on schedule — and on budget.

Pipe Overlay for PWRs and BWRs

For primary water stress corrosion cracking (PWSCC) initiated in Alloy 600 base material and Alloy 82/182 welds at the pipe-to-vessel nozzle joint, our OD full structural weld overlay uses Alloy 52 to reinforce the nozzle outward from the vessel. We employ the temper bead technique (using Machine GTAW) to apply the weld overlay on the low-alloy steel portion of the nozzle across the weld onto the attached pipe. The final weld overlay and surrounding area are ultrasonically examined and surface-examined using PT and/or
MT in accordance with the ASME Code and applicable Code Cases. The structural weld overlay is applied using a standard orbital machine welding system modified for remote operation and extended cross-seam travel.

Our weld overlay saves both time and costs. Moreover, the NRC has approved this repair approach. If you have an emergent repair, the process does not require specialized tooling, so we can mobilize and complete your repair quickly and safely. Weld overlays mitigate PWSCC damage and prevent recurrence quickly and safely.

New Technique for Weld Inlay

To provide a more comprehensive repair technology, AREVA has initiated a new Reactor Vessel Primary Nozzle Inlay (RVPNI) development program. Our teams, the most responsive in the industry, are working on this program, while investing substantially to design a Flooded Cavity Delivery System (FCDS) that delivers robotic tooling to primary nozzles for inlay operations. The FCDS design provides a platform that enables RVPNI on multiple nozzles in parallel while keeping radiation exposure to a minimum. It’s all accomplished while maintaining the reactor vessel internals underwater and controlling the inlay operations from a safe, low dose location. With our enhanced inlay technique, you can minimize schedule impact and radiation exposure for weld repairs.

Narrow Groove Welding

Narrow Groove Welding reduces total weld time for a given wall thickness by bridging the weld prep bevel surfaces with each weld pass. Precision fitup enables single pass tie-ins for the items to be welded. Advantages include superior weld quality, higher performance reliability, less filler metal, shorter welding time, lower radiation exposure and less weld shrinkage.
ELECTRICAL DISCHARGE MACHINING (EDM)
Solving Machining Challenges for BWR and PWR plants

Need an innovative solution to a drilling or machining challenge in your plant? AREVA is using Electrical Discharge Machining (EDM) technology to make repairs to both PWR and BWR plants — sometimes while the system is still in operation. Underwater or under pressure, EDM is being used as an integral piece of total repair processes as well as for complete solutions. Based on time-tested technology, our EDM solutions include task-specific tooling modifications and innovative applications that leave behind little residue — and big satisfaction.

EDM Used to Address PWR Piping Inspections

In 2008, the NRC mandated piping inspections to locate high points in safety-related systems of PWR plants that might inhibit proper operation in an emergency situation. A strict time limit was instituted on utilities to find a resolution or face reduced operating capabilities. AREVA responded with an innovative solution using EDM technology to install vent valves in piping to remedy high points found within the primary system — in some cases while the system remained in operation.

EDM Used for Innovative Solution to BWR Repair Challenges

Circumferential cracking in shroud support Access Hole Cover (AHC) welds has challenged the BWR industry since 1988. The solution — AREVA’s unique, in-situ repair method which restores the integrity of the AHC without penetrating the core coolant boundary. AREVA EDM tooling is used to generate unified standard thread features in the shroud support allowing strongbacks to be bolted across the AHC. Proven in the field, AREVA tooling has also remotely threaded holes in the shroud allowing an industry first core spray piping repair to be simply bolted in place.
Proactively Excluding Foreign Material

The appeal of AREVA’s EDM not only includes its ability to create detailed machine geometries, but also in how it handles the byproducts of the process. EDM swarf, micron-sized material suspended in solution, is simply pulled from the area and processed — making it well-suited for use in primary coolant where even small particles, if left in the system, can be a threat to nuclear fuel assemblies.

The adaptability of EDM technology allows AREVA to exceed customer expectations and keep plants operating safely with innovative and customized solutions to your machining challenges.
TECHNICAL SEALING PRODUCTS
LATTYgraf 6940 and 6940EF Eliminate Valve Leakage Issues

LATTYgraf 6940 and 6940EF are dependable materials designed to eliminate valve leakage issues while maintaining efficient valve operability. LATTYgraf 6940 is PTFE-free while 6940EF includes a PTFE level of <7%. The complete line of graphite packing, developed for nuclear power needs, performs exceptionally well at high temperature, speed and pressure — especially where chemical resistance, low absorbency and memory are advantageous.

Many of LATTY’s graphite valve and pump materials are manufactured from expanded graphite yarns, wire reinforced with an added corrosion inhibitor to eliminate the possibility of electrolytic attack on valve stems.

The braided packing materials are designed to provide effective sealing in worn stuffing boxes and has an exceptional ability to expand and move under load.

LATTY braided expanded graphite packing materials (LATTYgraf 6940) are designed to act as sealing rings and can be used without conventional die-formed graphite rings. In addition, the braided expanded graphite ring can be installed as an anti-extrusion, wiper or end ring providing adequate protection of thermal expansion. Valves contained in nuclear power plants require the most rigorous, proven and effective valve packing materials available. That’s why we work closely with site personnel to carefully engineer the most effective sealing solutions, including reduced gland loads, packing configurations, ring dimensions and anticipated friction values. But it doesn’t stop there. All of our material designs and mechanical properties result in volumetric stability, memory and exceptional radial movement.
LATTYflon 3260LM Reduces Existing High-Friction Values

AREVA's Nuclear Parts Centre (NPC) also offers LATTYflon 3260LM valve packing, created specifically for modulating control valves with valve operation issues. Uniquely designed, LATTYflon 3260LM incorporates a PTFE-impregnated carbon fibre core surrounded with an exterior braided PTFE fibre cover (jacket). The innovative combination of both materials significantly reduces friction and prevents stem chattering, enabling reduced operating loads and the use of smaller valve actuators.

The concept of incorporating two materials, each with their own independent benefits, provides the best solution to excessive valve stem friction. The benefits of PTFE in conjunction with the benefits of carbon make it possible to offer a material unmatched for the reduction of friction and regaining margin.

Combined with LATTYgraf 6940 as end rings, the combination can be installed where reduced friction is desired without compromising operability.

Replaces PTFE V-Rings to Ensure the Prevention of Leak Paths

The LATTYflon 3260LM’s PTFE impregnation and extremely close braid ensure the prevention of leak paths. In addition, the composition of graphite and PTFE has been documented as effective in exhaustive laboratory and field tests by the national electric utility of France. Moreover, in air-operated (AOV) applications, LATTYflon 3260LM has produced the best modulating valve performance available. These unique qualifications enable replacement for most PTFE V-rings and various configurations of graphite packing and composite materials. This highly durable product is also available in rolls, pre-cut or die-formed rings, enabling existing levels of inventory to be greatly reduced.
Valve Packing Monitoring Device (VPMD) Can Help Prevent Leaks

Partnered with TSP, AREVA’s NPC now has an effective method to monitor loss of packing load, in-service consolidation and volume loss prior to a valve leakage issue. The VPMD provides advance notice of a potential loss of packing volume and subsequent valve leak prior to the actual event.

The device is designed specifically for applications using gland loads provided by the customer. Implementing the benefit of live load springs, the devices are designed to maintain a predetermined load for extended periods. The ability to calibrate and torque on-site allows for the varied bolt and nut conditions throughout the industry and ensures the ultimate in gland load accuracy when calibrated — an integral component for monitoring valve packing performance on critical valves.

Mechanical Seals Eliminate Pump Seal Leakage Issues

AREVA’s NPC also offers a complete line of LATTY mechanical seals, designed for the nuclear industry and used globally to eliminate pump seal leakage issues. LATTY’s mechanical seal division features the latest technology in seal design and testing. Whether the need is a single cartridge seal, complete balanced seal, complete unbalanced seal or a double cartridge, they are ALL available as a solution to various pump seal issues.

LATTY seals are designed to operate in high-pressure, high-temperature, highly-corrosive environments — and even slurries. These mechanical seals are designed to eliminate pump seal failure and increase the dependability, reliability and efficiency of your pumps. And you can only get them at AREVA’s NPC.
Reactor Services

Tailored to Your Specific Needs
At AREVA, our responsive NPC offers an immediate delivery program, training, comprehensive valve packing program, and sizing application review for all LATTY products. We realize that relationships are just as important as technology, and can tailor a package to meet the specific needs of your plant. LATTY can provide you optimum pump, valve and flange sealing solutions.

LATTY Fluid Sealing Products
As an authorized distributor for Technical Sealing Products (TSP; LATTY International), AREVA’s NPC offers a wide range of field-proven, innovative sealing solutions available for the 21st Century. Since 1920, LATTY International has designed, developed and manufactured mechanical packing and mechanical seals to industry worldwide. Crafted from the finest, most durable materials and second to none in valve, pump and flange sealing, LATTY sealing products are what you would expect from the world leader in fluid sealing.
PLANT STUDIES

LIFE CYCLE MANAGEMENT SERVICES

More Security: Eliminate Reliability Issues

AREVA’s Life Cycle Management (LCM) services help customers reduce or eliminate unplanned equipment reliability issues and improve plant performance. Our global knowledge base offers innovative solutions that can eliminate virtually millions of dollars in excess operations and maintenance costs over the extended life of your plant. AREVA deploys the industry’s most responsive personnel — all committed to helping you reliably deliver power to the grid at a reasonable cost, while developing asset value and ensuring the greatest return on investment to your shareholders.

More Integration: Optimize Plant Life

We can integrate equipment aging management, operations, maintenance, licensing and engineering with economic planning and other activities to:

- Minimize equipment reliability issues
- Manage the material condition of the plant
- Optimize the remaining operating life of the plant
- Maximize plant value

More Experience: Enhance Efficiency

Our LCM process employs field-proven experience in Aging Management and Asset Management to help customers operate plant systems for the
remaining life of the plant — at the lowest possible cost. We can also help you lower the probability of an unexpected plant shutdown and support your efforts to ensure long-term economic viability to the generating asset.

**More Help for the Future**

Every day is a new opportunity for us to help customers assess the greatest challenges to their system. We can help you plan for tomorrow and resolve issues before they create headaches. Our LCM team has produced LCM plans at several U.S. plants and an international plant, resulting in projected long-term savings of more than $114 million.

**Features and Benefits**

- Improved equipment reliability
- Financially optimized, long-term aging and obsolescence management plans for critical plant components
- Identification and mitigation of the risks associated with components that are critical to power generation
- Identification of the aging degradation mechanisms that can lead to unexpected shutdowns
- Corporate and/or engineering strategic plan integration
- Prioritization of competing options for capital, while meeting emergent needs

**O&M costs demonstrated with and without Life Cycle Management Planning**
Reactor Services

- Prioritization of plant modifications and planning for implementation
- Estimation of capital upgrades and development of a long-range plan

**Unparalleled LCM Program Features**

- Long-term life cycle management planning and implementation for plant systems, structures and components
- System and component criticality reviews
- Aging management reviews
- Obsolescence planning
- Engineering program reviews
- Work management program reviews
- Plant assessments for life cycle management planning/programs
- Development of site-specific LCM programs and procedures
- LCM training
- Materials aging degradation analysis (fatigue, corrosion and wear)
- Development of financial risk-optimized component replacement strategies
- Prioritization analysis of plant life extension activities based on risk and cost
- Development of component failure probability curves
- Development and analysis of alternative aging management strategies
- Development of implementation processes for system and component long-term aging recommendations
- Component repair/replacement evaluations
- Due diligence support
- Run/retire decision support
OUTAGE SERVICES

INTEGRATED HEAD ASSEMBLY (IHA) – A COMPREHENSIVE SOLUTION
Superior Design. Positive Results.

Our design, fabrication and installation experience provides you with the confidence of skilled expertise and the reassurance of dependable service. Our IHA design eases access to vital reactor vessel head components and lowers maintenance time. A CRDM cooling system, head area cable system, reactor head vent-piping and integral work platforms, ladders and removable access panels are all incorporated into the IHA. With cooling system and cable routing improvements, an easy cable connect/disconnect feature, minimized use of the polar crane, an innovative head-lifting frame, tailor made cable bridges, and an optimal lay-down space, we can complete the IHA installation efficiently and reduce personnel resources and man-hours normally needed for a project of this scope.

Though an IHA is not a capability required for a CANDU plant, it is included in this pamphlet to identify AREVA overall “Complete Outage Management” or “Turn Key” philosophy employed by our Utility Customers throughout the world.

AREVA also offers the following services in conjunction with the IHA or a large scale component replacement of this size:

- Total Integrated Outage Services, including Component Installations Design Change Packages
- Mechanical and Electrical Engineering Analyses
- Fans, Chillers, Vent Lines and Valves, Spare Components
- Head Area Cable Sets and Bulkheads
• RVCH Insulation with access ports for visual and robotic inspections
• Permanent Reactor Cavity Seal Plates
• Self-contained rod drive cooling system to minimize ductwork and piping
• Simplified access to head vent-piping interface
• IHA replacement available as part of overall head replacement package

Reduced Dose. Enhanced Safety.

AREVA’s IHA is designed with safety in mind. Numerous safety features are built into AREVA’s IHA to reduce the potential for personnel injury and to promote zero OSHA recordable accidents. For instance, the IHA incorporates the missile shield, eliminating six heavy lifts. The current CRDM cooling duct work is eliminated, greatly increasing the safety margin for reactor-head disassembly/reassembly activities. Virtually all work associated with disconnecting systems from the RVCH is performed from the refueling floor or walkways on the IHA — eliminating the need for a safety harness. In addition, the lower shroud is shielded, eliminating the need for the transfer and installation of lead shielding while the reactor vessel head is in the refuel canal. Handrails are included around the service platform and folding batwings. Features such as these contribute to an outage dose reduction increasing the safety margin for workers.

Our IHA design offers the potential for dose reduction between three to four REM per outage. Part of the design — the radiation shield surrounding the CRDM nozzles — replaces the need for temporary shielding around the lower shroud.

Key Safety Features of the IHA
• Cables uniformly routed along specified paths and contained in cable trays to prevent tripping hazards.
• Retractable cable bridges reinforced to support personnel load.
A hoist rail system allows for easy installation of trolleys without a manbasket or work platform.
Moveable radiation shielding around lower shroud eliminates temporary shielding installation.

Feature highlights
- Integrated Missile Shields
- Improvements to Head Vent Routing and Connections
- Integrated Shielded Work Platform
- Integrated Fans and Ductwork
- Improvements to CCW Line Connections
- Integrated Shielding

Summary of Benefits
- Reduction of nearly six critical path outage days
- Design addresses main barriers to reduced outage schedules
- Dose reduction of three-to-four person REM per outage
- AREVA’s IHA design achieves the lowest personnel exposure in the industry for an RVCH replacement
- We can complete your IHA installation within a normal refueling outage schedule
- Safety design reduces potential for personnel injury and promotes zero OSHA recordables
AREVA’s Metrology Services unit has a full-time staff of professionals dedicated to support the measurement needs of the nuclear industry and ongoing research and development efforts.

Our commitment, coupled with an extensive inventory of advanced technologies, makes AREVA the industry’s most experienced and versatile provider of quality metrology services. We know the importance of outage efficiency. That’s why our level of nuclear experience and in-depth knowledge of outage schedules ensures seamless integration with other outage activities. All of our operators are OSHA-certified, adhering to stringent safety practices.

Moreover, we are committed to ongoing innovation and technical training for a superior end product. Our teams can support a wide range of needs – from precision measurements accurate within .001” to large-scale, survey-grade accuracy and as built surface modeling accurate within .25”. Our wide range of metrology services supports design engineering, fabrication, installation, dimensional receipt inspection, large volume surface modeling, and interference detection and animation creation. Innovative technologies include digital photogrammetry, complete 3D CADD analysis and
visualization, laser tracking, industrial total stations, and laser scanning.

**Versatile Photogrammetry Technology**

Photogrammetry is one of the most versatile measurement technologies available for the industrial market. In fact, we can even achieve accuracy to within +/- .005. An operator takes pictures of the object of interest from varying angles. We’ve even developed a new offering for underwater photogrammetry. Since the digital camera works on typical photographic principles, an image is captured at a high shutter speed, eliminating the need for a tripod or stable perch. The ability to take seemingly arbitrary handheld pictures from varying angles minimizes the impact of ongoing work. One can survey an entire object without interrupting or disturbing other activities and personnel within the area.

**Helping You Achieve the Perfect Fit**

Our measurement and modeling services can enable you to implement the design and fabrication associated with plant system modifications and new or replacement components – much earlier in the project life-cycle. It’s all to provide the compatibility to mate to existing systems including piping – even to flanged connections, HVAC, electrical and support structures.
We can analyze potential interference conditions long before your component is built and delivered. But there’s more. If incorporated into design engineering, we can ensure an interference-free piping and system modification design. We also verify that components meet their design dimensional specifications – prior to leaving the fabricator’s facility to allow for modification if required.

**Features and Benefits**

- Advanced metrology services
- American Society of Photogrammetry and Remote Sensing (ASPRS) certified photogrammetrist on staff
- Proven experience integrating multiple metrology technologies
- Installation and design risk mitigation
- Advanced interference notification
- Minimized rework
- Schedule savings = decreased cost
- Reduced personnel radiation exposure
- Customized applications to meet your specific needs

**Technical Features**

Fast results – We make results available within minutes of completing the object photography (when using our single camera system). But we can provide instant results when we use our two-camera online system.
**Flexibility**

AREVA uses the system in a wide range of applications, including partial inspection, deformation measurement – and partial adjustment.

**Portable**

We can take our battery-operated, highly portable system to the most remote locations. In fact, our teams can complete a measurement at the customer site with just one “size-wise” carry-on case and a laptop computer.

**Minimal Temperature Effect**

Our team can typically complete photography in 10-15 minutes, reducing the effect of temperature differential between the start and end of measurement.

**Immune to Vibration**

The system even works in unstable environments including vibrating or unstable floors, man lifts, cranes and ladders. The object being scanned can vibrate or move during the measurement without affecting the results.

**Versatile in Confined Spaces**

The small system can operate in even the most challenging line-of-sight environments.

**High Data Rates**

The system lends itself well to high-point data requirements. Increased processing time for larger volumes of data is minimal.

**Proven Track Record**

AREVA enjoys a field-proven track record of providing the latest high-tech metrology services.
METROLOGY SERVICES 3D CADD ANALYSIS AND VISUALIZATION

AREVA’s Metrology Services unit has a full-time staff of professionals dedicated to support the measurement needs of the nuclear industry. Our commitment, coupled with an extensive inventory of advanced technologies, makes AREVA the industry’s most experienced and versatile provider of quality metrology services. We know the importance of outage efficiency. That’s why our level of nuclear experience and in-depth knowledge of outage schedules ensures seamless integration with other outage activities. All of our operators are OSHA certified, adhering to stringent safety practices. We are committed to ongoing innovation and technical training for a superior end product.

Our teams can support a wide range of needs — from precision measurements accurate within .001” to large-scale, survey-grade accuracy and as-built surface modeling accurate within .25”. Our wide range of metrology services supports design engineering, fabrication, installation, dimensional receipt inspection, large volume surface modeling, and interference detection and animation creation.

Innovative technologies include complete 3D CADD analysis and visualization, laser tracking, industrial total stations, photogrammetry and laser scanning.

As-Built 3D CADD Analysis Eliminates Spatial Conflicts

AREVA Metrology teams offer you superior 3D CADD services by utilizing only the most advanced, innovative measurement technologies. We use 3D visualization abilities to virtually eliminate the possibility of spatial conflicts with structural elements in new designs.

We can perform services for component removal and installation interference detection, as-built modeling and animation creation.
Helping You Achieve the Perfect Fit

Our measurement and modeling services enable you to implement the design and fabrication associated with plant system modifications and new or replacement components — much earlier in the project life-cycle. This provides the compatibility to mate to existing systems including piping — even to flanged connections, HVAC, electrical and support structures.

We can analyze potential interference conditions long before your component is built and delivered. If incorporated into design engineering, we can ensure an interference free piping and system modification design. We also verify that components meet their design dimensional specifications — prior to leaving the fabricator’s facility to allow for modification if required.

Technical Features

- As-built 3D modeling generates as-built 3D CADD models of existing components and structures to support design modifications, load path analysis and volumetric studies
- As-built 3D modeling supports:
  - Component installation interface alignment
  - Component load path interference detection
  - Interference-free piping design modifications
  - Interference-free structural design modifications
  - Electronic component removal and installation simulation
METROLOGY SERVICES LASER SCANNING

New technology advancements offer easy visualization and basic measurement extraction from the collected data. Also, new software will allow users to perform virtual walk-through and measurement tasks from their own personal computer. The software is intuitive and requires on training, its accurate (+/- .25 inch) and comes with unlimited usage restrictions.

Laser Scanning Captures Complex Surface Geometries

Laser scanning accurately captures complex or irregular surface geometries of objects that require engineering or survey-grade accuracy (+/- .125 inch). The process substantially enhances efficiency to help measure and model every feature within the survey envelope, especially hard-to-reach, awkward areas and items. We can easily export the finished as-built 3D models to popular CAD packages for subsequent use in design of facilities, interference-free system modifications or site documentation. Laser scanning also replaces traditional field walk downs, minimizing resources and personnel dose exposure while increasing the amount and accuracy of the collected data.

Helping You Achieve the Perfect Fit

Our measurement and modeling services can enable you to implement the design and fabrication associated with plant system modifications and new or replacement components — much earlier in the project life-cycle. It’s all to provide the compatibility to mate to existing systems including piping — even to flanged connections, HVAC, electrical and support structures.

In addition, we can analyze potential interference conditions long before your component is built and delivered. But there’s more. If incorporated into design engineering, we
Reactor Services

can ensure an interference free piping and system modification design. We also verify that components meet their design dimensional specifications — prior to leaving the fabricator’s facility to allow for modification if required.
Component replacement challenges occur when engineering designs and plans meet real-world conditions — often during the critical stages of on-site execution, resulting in schedule delays and cost overruns. But now you can avoid the uncertainties of theoretical design information. AREVA offers comprehensive metrology services to help you collect, measure and analyze real-world data for the specific needs of your plant.

Laser Trackers — The Ultimate Tool for Accuracy

For extreme accuracy — even within only .001 of an inch — AREVA utilizes laser tracker technology. The iterative tracker design we use features a superior sealed mechanical system with years of experience in harsh environmental operations. Now we can align, measure, and scan faster and easier than ever before. This latest innovation also minimizes systematic measurement errors, resulting in superior tracker stability, range and accuracy.

Helping You Achieve the Perfect Fit

Our measurement and modeling services can enable you to implement the design and fabrication associated with plant system modifications and new or replacement components — much earlier in the project life-cycle. It’s all to provide the compatibility to mate to existing systems including piping — even to flanged connections, HVAC, electrical and support structures.

In addition, we can analyze potential interference conditions long before your component is built and delivered. But there’s more. If incorporated into design engineering, we can ensure an interference free piping and system modification design. We also verify that components meet their design dimensional specifications — prior to leaving the fabricator’s facility to allow for modification if required.
Technical Specifications

Specifications

- Max lateral target speed: > 3.0 meters/sec (120°/sec)
- Max acceleration all directions: > 2 g

Range of Measurements

- Horizontal: 640° (± 320°)
- Vertical: + 80° to - 60°
- Measuring Dia. (IFM and ADM): > 120 meters (400 feet)*
- Angle Resolution: ± 0.07 arc-second
- Internal level accuracy: ± 2 arc-second

3-D spatial measuring performance

- Resolution: 1 μm
- Repeatability: 2.5 ppm (2 sigma)
- Absolute Accuracy of a 3D Coordinate
- Static: ± 5 ppm (2 sigma) 0.001” (25 μm)
- at 16 feet (5 meters)
- Dynamic: ± 10 ppm (2 sigma) 0.002” (50 μm)
- at 16 feet (5 meters)

Laser Interferometer Distance Performance

- Resolution: 1 μm (user programmable from 0.1 to 1 μm)
- Accuracy: better than 0.5 ppm
- Maximum speed: infinite

ADM Distance Performance

- Resolution: 1μm (user programmable from 0.1 to 1 μm)
- Accuracy: ±15μm or 1.5ppm, (whichever is greater) /

•
0.0006” (15 μm) at 16 feet (5 meters) / ± 0.0012”
• (30 μm) at 65 feet (20m)
• Maximum speed: infinite

**Environmental**
• Air Temperature: -10°C to > 40°C (14°F to > 104°F)
• Barometric Pressure: 580 mmHg - 800 mmHg
• Relative Humidity: 10-92.5% Non-condensing
• Altitude: 2000 Meters

**Physical Features**
• Weight of Tracker Head: 8.5kg (18.5lbs)
• Weight of Controller: 3.2kg (7lbs)
• Total Package Weight: 23kg (50lbs) **

* with selected targets
** includes carrying case, tracker, controller, tools, cable, accessories
AREVA’S NUCLEAR PARTS CENTRE (NPC)

AREVA’s Nuclear Parts Center (NPC) is the only authorized distributor of safety related and non-safety related Limitorque parts for the nuclear industry and the Master Distributor of ASCO nuclear products. AREVA’s NPC is also a stocking distributor of Velan, Meggitt, Latty, Yarway, Stearns Roger Fuel Handling Equipment as well as other parts and equipment. In addition, AREVA’s NPC is a designer and/or manufacturer of cartridge filters, pressurizer heaters, valve and motor diagnostic equipment, cable assemblies, and the only authorized service center for refurbishing or repairing ASCO Hydramotor® Actuators. AREVA’s NPC provides responsive 24 hour/day, 7 day/week coverage and has supplied parts to every commercial nuclear power station in North America as well as a large number of plants abroad.

AREVA’s NPC is a Distributor for:

- Limitorque Actuators, Parts, and Motors
- ASCO Solenoid Valves (Nuclear and Commercial)
- ASCO Hydramotor® Actuators and Parts
- ASCO Pressure/Temperature Switches
- Anderson Greenwood Crosby (Yarway) Valves
- Tyco (Hancock and Yarway Commercial Valves)
- Velan Valves
- Meggitt Containment Atmosphere Monitoring Systems (CAMS) Spare Parts
- Reliance and Siemens Electric Motors
- LATTY Fluid Sealing Products
- Rockbestos Cabling
- AREVA (Cutler Hammer) Electrical Products
- AREVA RC Pump, Seal, and Motor Parts
- AREVA NP CRDMs for Westinghouse Plants
- AREVA NP (Diamond) Stud Tensioner Parts
AREVA’s NPC is a Manufacturer and Designer for:

- Cartridge Filters
- AREVA/Stearns Roger Fuel Handling Equipment
- EMPATH (Motor Diagnostics)
- UltraCheck Valve Diagnostics (A, C, L, M, RV, SPT)
- ASME Code Components
- Pressurizer Heaters
- NSSS Parts
- Cables
- Inventory Services Programs
- ASCO Valve Inventory Optimization
- Limitorque Parts Inventory Optimization
- Equipment Refurbishment Services
- Dedicated Facility (Contaminated Equipment)
- ASCO Hydramotor® Actuators
- Control Rod Drive Mechanism, Stators, Pls
- Stud Tensioners (Diamond)

Benefits of the AREVA’s NPC:

- Responsiveness – 24 Hours/Day – 365 Days/Year
- Reduced O & M Costs
- Minimize Carrying Costs by Relying on NPC Inventory
- No Rejected Parts or Data Packages
- Reduced QA Costs
- Inventory Ready to Ship
- Material Procured and Delivered As-Needed
- Strong Technical Support
- Experience in Nuclear, Technical, and Quality Requirements
- Customer Inquiry System (CIS)
- Real Time Access to Price and Availability through the Internet
- Direct Transmission of Releases to NPC
- Guaranteed Stocking Arrangements
- Committed to Customer Success
- Service and Quality
- Supply Chain Management Support
- Extension of the Plant Warehouse
- Long Term Agreements
- Blanket Orders
- Standard Requirements
About AREVA Canada

AREVA has been in Canada for more than 40 years and has a presence in several Canadian provinces and Nunavut. AREVA Canada has more than 600 employees and contractors in several locations across the country that are engaged in exploration, mining, manufacturing and solutions for CO₂-free power generation. A leader in Canada’s uranium production, AREVA is also a major player in the manufacture of radiation measuring equipment, and as a services and engineering provider for Canadian nuclear reactors.