

BNL ALARA Center

List Of Documents On ACEFAX-1

516-282-7361

General Documents

- 10 ALARA Notes No.8 (22 Pages)
- 12 List Of Documents On ACEFAX-1 - Short Version (14 pages)
Lists number and title of each document on ACEFAX-1 faxback system.
- 13 ACE Manual, Revision 5 (4 pages)
User manual for ACE, the Brookhaven National Laboratory ALARA Center's on-line information system.
- 14 ALARA Notes No. 9 (20 Pages)
- 15 Dollar Worth Of A Person-Rem For US Utilities (1 page)
Column chart of the monetary value allocated to save a unit of collective dose (compiled by Perry Nuclear Power Plant).
- 16 A Survey Of Doses To Worker Groups In The Nuclear Industry (13 pages)
BNL report by Tas Khan and John Baum, to be published in Radiation Protection Management.
- 17 Collective Dose Per Reactor For Selected Countries (1 page)
Column chart of collective dose data for 1985 and 1991.
- 19 Bournemouth Meeting On Water Chemistry Of Nuclear Reactor System #6 (10 Pages)
An attendee's meeting notes on the many excellent presentations of the Bournemouth Meeting, October 12-15, 1992.
- 20 List Of Documents On ACEFAX-1 - Long Version (20 Pages)
Lists number, title, and short description of each document on ACEFAX-1 faxback system.
- 21 The Program of the ALARA Center at Brookhaven National Laboratory (15 Pages)
Paper summarizing work of the ALARA Center between 1984 and 1992, which includes, among other projects, work on dose reduction at nuclear power plants, analysis of cost effectiveness of engineering modifications, and dose summaries of plant high-dose jobs.
- 22 BWR and PWR Collective Radiation Exposure 3-Year Rolling Average Tables for 1992 (2 Pages)
These two tables list U.S. PWRs and BWRs and show collective radiation exposure per site over the last several years, with a 3-year rolling average per unit.
- 23 Third International Workshop On Implementation Of ALARA At Nuclear Power Plants (4 Pages)
Registration information is included.
- 24 Third International Workshop On Implementation Of ALARA: Agenda
The latest schedule of presentations and events.
- 25 Subject Index For Jobs Database (1 Page)
- 26 Subject Index For Health Physics Technology Database (2 Pages)

Documents From The Health Physics Technology Database

- 138 Innovative Approaches At TMI-2
Three Mile Island 2 explores new ways to perform nuclear plant operations and maintenance tasks.
- 139 Identify All Cobalt Contributors In PNPS
Identifies cobalt contributors at Pilgrim Nuclear Power Station for cobalt-reduction actions.
- 140 Evaluate Hot Spots Associated With Spent Fuel Pool System
Characterizes hot spots, estimates resultant dose, evaluates alternative source-reduction actions.
- 141 Surrogate Laser Disc Plant Tour System
Benefits of computer-controlled laser disk photography for dose reduction.
- 142 Maintain Radiological Evaluation Factors
Proposes method for evaluation of projected dose effects of changes in plant facility, operation, or maintenance.
- 143 Replace Feedwater Control Valve Trim With Non-Cobalt Design
Discusses parts, materials, and procedures needed to effect change during maintenance.
- 144 Recirculation Pump Cobalt Elimination
Recommendation for specified non-cobalt, proven parts for pump overhaul.
- 145 Fuel Improvements To Reduce Cobalt Source
Recommendations for fuel procurement specifications.
- 146 Establish Chemical Decontamination Strategy
A report including a recommended chemical decontamination strategy and action plan.
- 147 Evaluate Zinc Addition To Reactor Feedwater (GEZIP)
Adding zinc to feedwater at Pilgrim Nuclear Power Station may reduce dose rates 30 to 50%.
- 148 Reactor Control Blade Management Considering ALARA
Describes proposed blade management program for Pilgrim Nuclear Power Station for remainder of license life and a plan for necessary design changes, analyses, procurement, and related preparations to effect recommended blade management program.
- 149 Evaluation, Possible Reduction In Operation And Testing Of CRDs To Reduce Cobalt Input
Recommendation and possible plan of action for use of CRDs at Pilgrim Nuclear Power Station.
- 150 Project Mindos
Oskarshamm Nuclear Power Plant (Sweden) approaches radiation exposure reduction by addressing: operational/refueling outage; information, attitudes, and motivation.
- 151 Study On The ALARA Policy In Korea
Status of Korean radiation protection and application of the ALARA principle to Korean Nuclear power plants.
- 152 Reduction Of Time, Exposure, And Cost Through Plant Decontamination
Duke Power investigation of area contamination, cost-benefit savings from reduced contamination. Costs and savings were monitored and results given.
- 153 Reactor Cavity Decontamination At V. C. Summer
Post-outage critique of 1990 refueling job. Several recommendations are presented.
- 154 Use Of Respirators And Dose Expansion
Study and results on the use of respirators during outages at Davis-Besse Nuclear Power Station.

- 155 Optimizing Worker Protection: A Practical Application Of Risk Analysis
Approaches to reduce risk at the Callaway Plant from internal or external radiation hazards, from non-radiological industrial hazards, and from stochastic and nonstochastic processes.
- 156 Advanced Radiation Worker Training Program And Laboratory
Davis-Besse program to train workers in various aspects of radiological safety.
- 157 Alara Aspects Of The Calvert Cliffs Pressurizer Repair Project
Measures taken to reduce the high dose rates in the pressurizer area and the radiation dose to workers during the pressurizer heater repair project.
- 158 ACE - ALARA Center's Dose-Reduction Information System
Description of Brookhaven National Laboratory ALARA Center on-line computer system containing databases with information on dose reduction and ALARA. The system can be accessed by means of computer and modem by the ALARA community.
- 159 An Effective ALARA Awareness Program
Westinghouse Hanford's aggressive ALARA Awareness Campaign objectives and program results.
- 160 An ALARA Training Program For Design Engineers
Westinghouse Hanford's design engineer training program components are described.
- 161 System Decontamination Of RWCU System
Sweden's use of the chemical oxidation-reduction decontamination method to decontaminate part of the RWCU system. Total decontamination time was 80 hours, with dose rates reduced by 77%.
- 162 Resistance Temperature Detector Bypass System Elimination
South Carolina Electric & Gas replaced an existing RTD bypass direct immersion system with the latest well mounted TDS to reduce reactor down time and avoid maintenance in high-dose areas.
- 163 400 R/Hr Hot Spot Removal At Cooper Nuclear Station
Describes the planning and task of replacing the bottom vessel drain line which had trapped several hot spots and had been a source of elevated dose to maintenance personnel.
- 164 Innovative Shielding
Toledo Edison's investigation of best type of shielding for a typical refueling canal configuration; investigation of comparative costs and person-rem benefits of various shielding materials and of possible applications of various types of water shields.
- 165 Removal Of Control Rod Drive Through Robotics
Public Service Electric & Gas' evaluation of the removal of control rod drives by means of Toshiba's remote-control rod-drive handling system.
- 166 Data Acquisition On PWR Contamination
A French program to quantify the sources of radiation and the resultant dose rates, to identify spatial distribution of contamination, contamination sources and the origin of exposure to personnel
- 167 Panther RP: A Tool For Evaluating Dose Rates
A Computer Aided Design (CAD) technique is being utilized by EDF Septen (France) to predict dose rates at nuclear power plants to predict key parameters such as sources and dose rates; measure actual vales of predicted parameters; and analyze the differences between predicted and measured values.
- 168 The Ingredients Of A Utility's Dose Reduction Program
Carolina Power & Light's program identifies and implements dose reduction actions at BWRs and PWRs.
- 169 Methods Used To Achieve Outage Goals At Diablo Canyon
Pacific Gas & Electric's program to reduce duration of outages and reduce collective dose during outages to bring it into line with INPO's recommendations.

- 170 Radiation Exposure Reduction Program At Mitsubishi Heavy Industries
Program developed to reduce occupational radiation exposure during design, maintenance, and inspection at Mitsubishi PWR plants.
- 171 Clamshell Nozzle/Pipe Shielding
Pennsylvania Power and Light reduces the time to quickly and effectively install shielding rings to perform inspection activities.
- 172 Feedwater Nozzle Thermal Sleeve Hydrolyzing
Pennsylvania Power & Light reduces radiation doses to nozzle inspection technicians in the drywell by flushing high-dose crud from the thermal sleeve region of the feedwater nozzles.
- 173 Snubber Positioning Fixture
Pennsylvania Power & Light realizes dose savings from new snubber tool and saves an average of 1 person-hours per snubber for removal and installation.
- 174 Removal Of Fine Chrome Particulate From Spent Fuel Pools By Means Of A Radial Lamella
Describes Advanced Manufacturing Technology's device to remove fine chrome particles of sub-micron size from spent fuel pools to improve visibility and limit dose.
- 175 A Method For Optimizing The Use Of Respiratory Protection In Radiation Areas
Develop an optimization methodology for deciding when to use respiratory protection equipment. The method should take into account the reduction in worker efficiency that results from the use of respirators as well as the costs associated both with using respirators and not using them.
- 176 Indian Point 2 Sub-System Decontaminations
Outline sub-system decontamination experience at Indian Point and discuss recontamination rates at Indian Point #2's Regenerative Heat Exchanger.
- 177 National Demonstration Of A Full RCS Chemical Decontamination
Provide a status report on plans for a FSD of Indian Point 2 in 1995 and detail several tasks that Consolidated Edison is working on toward that goal.
- 178 Plant E.I. Hatch Chemical Decon 1991
Outline the results of the 1991 Hatch Unit 1 Reactor Recirculation System (RRS) decontamination using AP/LOMI. Share the lessons learned from this decon operation.
- 179 Chemical Decontamination Of The Residual Heat Removal System
Outline the procedure and summarize the results of a recent chemical decontamination performed on the CP&L Brunswick Unit 1 Residual Heat Removal system using a one step CITROX process.
- 180 Ontario Hydro Decontamination Experience
Describe the CANDECON process and results obtained from past decontaminations. Discuss some key issues of design and operation that must be addressed to ensure a successful decontamination.
- 181 Resource Management As An ALARA Tool
Present the 7th Salem Generating Station Unit 2 refueling outage results.
- 182 PWR Upper/Lower Internals Shield
The goal of this R&D program was to design, develop, test and demonstrate a shielding system which would use the existing mass of the refueling pool water to provide shielding from the protruding components of the upper internals.
- 183 Internal Dose, Respiratory Protection And Revised 10CFR20 At Davis-Besse Nuclear Power Station
Describe the efforts at the Davis-Besse Nuclear Plant to limit the use of respirators in order to reduce the Total Effective Equivalent for workers by allowing a small internal dose. The goal is compliance with the provisions of Title 10, Part 20 of the Code of Federal Regulations.
- 184 Zion Unit 2 Cycle 12 Shutdown And Early Boration Results

- The Commonwealth Edison Zion Unit 2 reactor had early boration and hydrogen peroxide treatment for the cycle 12 refueling outage. This report summarizes the chemistry and radiological observations from Zion 2 cycle 12 and from the refueling shutdown.*
- 185 Health Physics Services On The Platform At Salem Using ROMMRS
Describe the capabilities of the Remotely Operated Managed Maintenance Robotic System (ROMMRS) and its role in performing health physics tasks.
- 186 Chemical Decon Of Systems: Results And Problems
1) Summarize the work done to date on the preparations for a FSD at Indian Point 2, 2) Summarize the fuel decontamination qualification program at the V.C. Summer site, 3) Summarize the results of the Fuel-In Full RCS Chemical Decontamination Seminar conducted on July 1993, 4) Present recent Westinghouse sub-system decontamination experience.
- 187 An Automated Program Implementing New 10CFR20 Requirements At Southern Nuclear Plants
Describe the development and implementation of an integrated software system developed by Canberra Nuclear for the three Southern Nuclear plants Farley, Hatch, and Vogtle in compliance with the new 10CFR20 regulations.
- 188 Steam Generator Replacement Project At North Anna Power Station
Summarize the steam generator replacement project at North Anna Power Station.
- 189 ALARA Programme Management And Organization In EDF Nuclear Power Stations
Show how EDF implemented the ALARA principle during the operational phases of its installations, and especially during maintenance.
- 190 Enhanced Radiation Worker Training At James A. Fitzpatrick Nuclear Plant
Discuss the radiation protection problems at the New York Power Authority (NYPA) FitzPatrick Plant and steps taken to improve radiological performance.
- 191 S/G Replacement At Beznau 1: Experience And Results In Radiological Protection
Describe the preparation, implementation, and results of the steam generator replacement at the Swiss Beznau 1 reactor in the context of radiological protection.
- 192 Partners In Performance: An ALARA Perspective
Present the benefits to a partnership between site and vendor ALARA.
- 193 Steam Generator Snubber Elimination
Implement the Westinghouse Steam Generator Snubber Elimination Program at the Wolf Creek and Callaway plants.
- 194 Future Power Stations In The United Kingdom: Designing For Low Doses
Utilize the design experience from the Sizewell 'B' nuclear power station nearing completion to develop potential steps that can be taken to improve operator doses on future PWR plants in the U.K.
- 195 A Team Approach For The Management Of Radioactive Liquid Effluents
Streamline the management of liquid effluents at the Davis Besse Nuclear Power Station.
- 196 ALARA And Work Management
Examine the effects of work management on occupational exposures.
- 197 Radiological Assessment Of Decommissioning At Fort St. Vrain
Present the current status of the decommissioning effort at the Public Service Co. of Colorado Fort St. Vrain reactor.
- 198 Personnel Radiation Exposure Reduction During Remote Stud Handling At Indian Point 2
Describe the usage of the remote study handling system during the February 1993 refueling outage at Indian Point 2.
- 199 Replacement Of RWCU Piping With State-Of-The-Art Materials

- Replace the reactor water cleanup system (RWCU) piping at the Perry Nuclear Power Plant and record the dose savings resulted from it.*
- 200 Evaluation Of Zircaloy Fuel Clad Oxidation At Millstone 3 PWR
Analyze plant data on Zircaloy-4 clad oxide thickness taken from Millstone 3 in comparison with data from North Anna 1.
- 201 An Update On Chemistry Related Dose Reduction Efforts At Millstone Nuclear Generating Stations
Describe the ALARA efforts at Northeast Utilities and the results from elevated pH, zinc injection, decontaminations, electropolishing, etc.
- 202 Surface Characterization Of The Steam Generator Channel Head Following Mechanical/ Electropolishing At Millstone Point Unit 2
The Surface Roughness Measurement Program for Millstone Point Unit 2 was developed to investigate the effects of mechanical polishing versus electropolishing with respect to surface roughness.
- 203 Chromium Treatment Of RHR Piping
1) Investigate feasibility of using phosphoric acid based chromium plating bath to improve process application, 2) Develop a range of acceptable chromium plating parameters for treating plant components, 3) Evaluate effectiveness of surface pretreatments to mitigate activity buildup on out-of-core components, 4) Scale-up the chromium pretreatment process to full size components
- 204 On-Line Monitoring Of Dose Rates And Surface Activity During The Cycle 17 Shutdown Of Ringhals 2
Monitor in detail and collect data for the 1993 outage in Ringhals 2.
- 205 Corrosion Products Behavior In French Pressurised Water Reactor During Shutdown Operation
Carry out primary water and deposited activity measurements with a portable gamma spectrometer. Measurements were obtained from 20 shutdowns of 900 MWe PWRs.
- 206 PWR Startup And Shutdown Chemistry Guidelines
Develop PWR startup and shutdown chemistry guidelines from the study of industry data and experience by an ad-hoc committee formed by several utilities and EPRI.
- 207 Update On Dose Rates In Siemens-Designed PWRs
Investigate: 1) Radiation fields in Siemens/KWU PWRs, 2) Influence of the cobalt replacements on Co-60 activity concentration in the coolant and on the system surface, 3) Comparison of Co-60 and Co-58 concentration levels, 4) Overview on the occupational radiation exposures.
- 208 Dose Rate Trends And Chemistry At Siemens-Designed BWRs
Investigate the dose rate trends and chemistry at Siemens-designed BWRs.

Documents From The Research Database

- 1229 Verelight - A New Light Manipulator For Steam Generator Inspection
A light inspection robot designed for carrying out steam generator inspections. It can perform light duties such as tube plugging, positioning of eddy current multi-probe holders, ultrasonic inspection, and boroscope inspection.
- 1250 Development, Fabrication, And Test Of The Odex-3 Maintenance Vehicle
A joint EPRI-Odetics robot application project for nuclear power plant maintenance. This robot is expected to have an appreciable impact on dose reduction.

- 1251 Source Book For Chemical Decontamination Of Nuclear Power Plants
EPRI source book including summaries of the highlights from EPRI studies of decontamination technology. An important guide for the EPRI Occupational Radiation Control Program. Technologies are described, lessons learned by utilities, and ways of reducing radiation exposure are indicated .
- 1252 The Nature And Behavior Of Particulates In Pwr Primary Coolant
EPRI report studying the nature and behavior of particulates in the primary systems of operating PWR plants.
- 1253 Pwr Radiation Control Demonstration
EPRI reports evaluating the effects of elevated pH and lithium hydroxide on radiation field buildup and on fuel cladding corrosion during 18-month fuel cycles at Millstone 3.
- 1254 Field Tests Of Radiation Control Techniques - 1
The object of this project is to demonstrate the technique of zinc injection passivation for operating nuclear power plants.
- 1255 Effect Of Surface Treatments On Radiation Buildup In Steam Generators
This project determines the effects of electropolishing and prefilming on accumulation of radioactivity in PWR components; to characterize corrosion films that form during in-reactor exposure of treated surfaces.
- 1256 Millstone 1 Zinc Injection Evaluation
An evaluation of the effects of zinc injection at an older BWR plant.
- 1257 Pwr Steam Generator Preconditioning Studies
A project to determine the effects of prefilming using hot, moist air on the release of corrosion products from Inconel steam generator tubing.
- 1258 The Treatment Of Radioactive Ion-Exchange Resins
Project aimed at designing and operating a pilot-scale system for demonstrating the resin wet oxidation process using hydrogen peroxide and to verify resin volume reduction and effective destruction of resin organic components, including chelates.
- 1259 Pwr Corrosion Tests Using Lomi
Project to qualify the LOMI decontamination process for full-system decontamination of Westinghouse-designed PWRs with fuel removed.
- 1260 Crud Transport Chemistry
Project to improve understanding of factors influencing crud formation, transport, and deposition, including coolant and feedwater chemistry, and to prepare PWR primary water chemistry guidelines.
- 1261 Qualification Of Cobalt-Free Hardfacing Alloys For Lwr
Project to qualify promising cobalt-free hardfacing alloys, identified in laboratory tests for use in nuclear valves by evaluating their performance in loop and field tests.
- 1262 Production Of Norem Hardfacing Alloys
The aim of this project is to obtain weld consumables and cast products of the NOREM iron-base hardfacing alloys using standard commercial practice.
- 1263 Cobalt Replacement Guidelines
The aim of this project is to develop guidelines that will assist nuclear utilities in introducing new cobalt-free hardfacing alloys into nuclear plant components, especially nuclear valves.
- 1264 Bwr Cobalt Deposition Studies
Project to identify key factors that control cobalt deposition on stainless steel in BWR piping systems.
- 1265 Research Reactor Loop Water Chemistry Study
Project to study effects of water chemistry and surface condition on corrosion product transport and deposition in a reactor circuit.

- 1266 Radiation Field And Dose Data Assessment
Project to correlate plant dose data with plant specific parameters including outage time, special maintenance, and radiation fields to establish the relative importance of general radiation fields and hot spots in determining worker doses.
- 1267 Passivation And Surface Conditioning
Project to qualify advanced passivation/preconditioning methods that reduce cobalt-60 pickup by using these methods on plant components whose performance will be monitored over a number of cycles.
- 1268 Feedwater Flow Element Improvement
Project to minimize losses of power output that result from deposition of corrosion products on the venturis that are used to measure feedwater flow.
- 1269 Coolant Chemistry And Radiolysis In Boiling Reactor Coolant
Project to determine how much hydrogen is needed to suppress radiolytic oxygen and hydrogen peroxide in a boiling LWR core.
- 1270 On-Line Monitoring Techniques For Redox Potential, Hydrogen Concentration, And Ph In Nuclear Reactor Coolant Circuits
Project to develop continuous, on-line, long-lived, reliable monitoring instruments to detect corrosive conditions in LWR water circuits at full operating temperatures.
- 1271 In-Plant System For Continuous Low-Level Ion Measurement In Steam-Producing Water
Project to adapt a commercially available laboratory ion-chromatograph for semicontinuous measurements of corrosive species in liquid water in steam electric power plants.
- 1272 Resin Separability To Improve Polishing Under Morpholine Avt
Project to measure the degree of separation of cation from anion resin required to give acceptably low sodium leakage in the mixed bed made up from regenerated resins in the laboratory.
- 1273 Radiation Field Trends In Westinghouse-Designed Plants
Project to observe collective dose and dose rate trends at Westinghouse PWR plants and, through these observations, evaluate the relative significance of the factors that affect plant dose rates and plant collective doses.
- 1274 Oxygen Transport In Bwr Cycles
Project to observe collective dose and dose rate trends at Westinghouse PWR plants, and through these observations, evaluate the relative significance of the factors that affect plant dose rates and plant collective doses.
- 1275 Remote Repair Technique For Msivs
To develop a process to refurbish the seats and guides of the main steam isolation valves used in nuclear power plants, using a remote controlled welding technique.
- 1276 Intellitorque : A System For Monitoring Root Cause Of Mov Malfunctions
To identify the major causes of valve malfunctions and provide a means of effective corrective action.
- 1277 Using Ultrasonics To Avoid Check Valve Disassembly
To provide a diagnostic system, based on ultrasonics to test valves for instability.
- 1278 A "Wet Motor" Sealless Pump For Reactor Water Clean Up System In Bwrs
To investigate the use and problems associated with "wet motor" sealless pumps installed in reactor water cleanup pumps in BWRs.
- 1279 A Rotating Ut System For Inspection Of Steam Generator Tubes
To develop a field deployable rotating ultrasonic system capable of inspecting steam generator tubes.

- 1280 The Alok 3 Ultrasonic Inspection System
The ALOK 3 system can be used for in-service inspection of lower sections of reactor pressure vessels and, with different manipulators, for primary system components. The aim of the project is to speed up inspection time, obtain more reliable results, and document the results in a more efficient manner.
- 1281 Acoustic Leak Monitoring In Japan
To examine the use of acoustic leak monitoring as a means of estimating leak rate and detecting BWR safety relief valve opening, without affecting operating conditions.
- 1282 Use Of Vibration Monitoring To Assess Reactor Coolant Pump Integrity
To confirm the integrity of reactor coolant pump shafts at St. Lucie through vibration monitoring.
- 1283 Improved Test Methods For Plant Protective Coating
This project will provide the technical basis for utility guidance in testing, selecting, and maintaining improved decontaminable coatings.
- 1284 Automated Control Rod Drive Bolting Wrench System To Support Boiling Water Reactor Maintenance
To develop a system which allows a single mechanic to completely remove or replace control rod drive bolts from beneath the reactor vessel without disturbing the control rod drive radiation shielding.
- 1285 Measurement Of Oxide Film Released As Particles During The Can-Derem Decontamination Process
Measure the amount of oxide film released as particles during a CAN-DECON/CAN-DEREM process. Determine mass and concentration of particles and their effects on critical mechanical components.
- 1286 "Wet Motor" Sealless Pump For Reactor Water Clean Up System In Bwrs
Reduce frequent seal replacement maintenance and improve system reliability by eliminating the two 50% capacity mechanical seal pumps initially installed in the reactor water cleanup system and replacing them with 100% capacity sealless pumps capable of withstanding system thermal transients.
- 1287 Reactor Water Cleanup (Rwcu) Sealless Pump
Provide RWCU pump not prone to mechanical failures; reduction in maintenance costs/dose received.
- 1288 Exposure Reduction Measures In The Design Of Siemens/Kwu Pwr Plants
To monitor the radiation dose rates and occupational exposures at Siemens/KWU plants, correlate them with plant features, and apply this knowledge to plant operations and subsequent plant designs.
- 1289 Full System Decontamination Of The Br-3 Pwr Plant
Siemens/KWU has an ongoing program to carry out full system decontamination on a number of reactors using the Chemical Oxidizing Reducing Decontamination (CORD) process.
- 1290 Mitigation Of The Impact Of Reduced Radiation Exposure Limits On Nuclear Power Plant Operations
To assess the impact of lower exposure limits on operations and maintenance activities at US Nuclear Power Plants. Second objective is to propose approaches which would help to mitigate the impact of new dose limits.
- 1291 Sources Of Cobalt-60 In The Primary Systems Of Pressurized Water Reactors
To assess cobalt-60 sources using three independent approaches.
- 1292 Performance Of Iron Base Hardfacing Alloys Under Pressurized Water Reactor Conditions
Evaluate performance of a number of iron base hardfacing alloys in comparison with Stellite-6 in simulated LWR and PWR conditions. To find suitable alternatives to cobalt-based stellites.
- 1293 U.K. Program To Qualify Cobalt-Free Hardfacing Alloys
To qualify cobalt-free hardfacing alloys with the focus on valve applications.

- 1294 Supplying Cobalt-Free Nuclear Valves
A program to evaluate new candidate materials for this application due to concerns about the radiation exposure of nuclear power plant maintenance personnel.
- 1295 An Examination Of Foreign Approaches To Controlling Radiation-Field Buildup In Boiling Water Reactors
To identify for use in US BWRs, those foreign approaches that lower radiation fields and decrease worker exposures.
- 1296 Guidelines For The Reduction Of Cobalt From Reactor Systems
Objectives of this program are: to identify valve/hardfacing design requirements; to review/summarize available data on cobalt-free hardfacing alloys; to identify appropriate valve and trim alloys in light of duty cycle; to summarize utility experience with cobalt-free alloys; to address prospective safety issues; to define tests to establish "equivalency" between Stellite and cobalt-free alloys; to identify cobalt impurity limits for structural alloys.
- 1297 Bwr Radiation Field Trends
Program objectives were to compile measurements of dose rates on BWR recirculation systems at standard point; to make interplant comparisons from the data collected; to analyze any trends.
- 1298 Status Of Zinc Injection In Boiling Water Reactors
Program objectives were to investigate the extent of radiation buildup in plants using zinc injection; to reexamine the Zn-65 outage release concern; to examine the availability of zinc depleted in Zn-64; to eliminate the precursor of Zn-65; to examine the impact of hydrogen water chemistry on zinc addition.
- 1299 Experience With Zinc Injection At Millstone 1
Program objectives were to demonstrate the impact of zinc injection on a mature plant with well established oxides; to examine the extent of Zn-65 outage release; to decontaminate the plant prior to implementation and then evaluate the overall impact of zinc addition; make recommendations to continue or to terminate after two fuel cycles with zinc injection.
- 1300 Control Of Radiation Fields At Boiling Water Reactors By Reducing Iron Input
Determine the source of radiation fields and to identify the most effective approaches to reduce them at a Susquehanna BWR plant.
- 1301 Effect Of Preconditioning On Cobalt Corrosion Release Rates
Tests were carried out on mill annealed Inconel 600, heat-treated Inconel 600, and heat-treated Inconel 690 tube specimens. Conclusions were drawn on the effect of preconditioning.
- 1302 Radiation Field Issues In Switching To Hydrogen Water Chemistry
To fully understand the mechanisms that cause the increases in dose rates and to develop appropriate remedial action.
- 1303 Qualification Of Electropolishing For Replacement Steam Generators
Study to establish criteria for surface modification of PWR channel head cladding, divider plat, and connector welds.
- 1304 French Experience With Electropolishing Steam Generator Channel Heads
A collaborative program between Framatome, EdF, and CEA to examine the potential of electropolishing to reduce high radioactivity buildup on steam generator channel heads and the resulting high radiation exposure to occupational workers.
- 1305 Surface Pretreatment Of Primary System Components To Reduce Radiation Buildup
Investigation of two primary techniques to reduce radiation buildup in PWR and BWR plants.
- 1306 Reducing Radiation Buildup By Surface Coating Of Primary System Components
The Doel-2 PWR was selected to carry out in-plant tests to evaluate the effect of surface treatment and coating in reducing contamination rate and to inhibit activity buildup on new surfaces.

- 1307 Pwr Primary Water Chemistry Guidelines - Revision 2
To promote industry consistency in addressing the need to minimize radiation buildup and to review the impact of chemistry on materials integrity. These guidelines are intended to serve as a model only for the development of site-specific programs.
- 1308 Reduction Of Radiation Fields By Elevated Ph Control At Millstone-3
Project on the effects of elevated lithium on Zircaloy corrosion during extended fuel cycles at Millstone-3.
- 1309 Loop Experiments On Zinc Injection Under Pwr Conditions
Investigation on the effects of zinc addition on PWR materials under simulated PWR conditions and to monitor film growth on Alloy 600 and Type 304 stainless steel, cobalt release from Alloy 600 and cobalt-60 pickup by Alloy 600 and stainless steel.
- 1310 Corrosion Control And Dose Rate Reduction
Project to evaluate chemistry of zinc addition for PWR systems; determination of equilibrium film composition; stability of zinc containing films; electrochemical characteristics; microanalytical characterization; crack growth rate as a function of zinc addition; reverse U-bend testing; and activity reduction mechanisms.
- 1311 Effects Of Ph And Li On Pwscc Initiation And Growth
Project to determine whether significantly different PWSCC initiated and growth rates are observed in higher Li primary water chemistries.
- 1312 Radioactivity Pickup By Carbon Steel And Stainless Steel In Slightly Oxidizing Lithiated Coolant
Program to determine how oxide films on carbon steel and type 403 stainless steel change when oxygen is added to the coolant and how Co-60 pickup on carbon steel and stainless steel is affected by oxygen at CANDUs.
- 1313 Lessons Learned From Recent Bwr Chemical Decontamination Applications
Project aims are to realize economical exposure reduction, reduce high radiation fields, combined with a large amount of work in the dry well area. Other goals include increasing effectiveness, reducing unscheduled delays, and allow for contingency measures.
- 1314 Decontamination Of Beaver Valley Steam Generators Using The Can-Derem Process
Project objectives were to assess CAN-DEREM and CAN-DECON processes for the decontamination of steam generators of the Beaver Valley Nuclear Power Plant; to assess the results of the Beaver Valley decontamination and other recent developments.
- 1315 Pwr Full Reactor Coolant System Chemical Decontamination
Description of the results of the second phase of a program to qualify the chemical decontamination, through the AP/CAN-DEREM and AP/LOMI processes, of the full primary system of Westinghouse and Combustion Engineering designed PWRs, with the fuel removed and to complete a fuel decontamination qualification program.
- 1316 Bwr Full System Decontamination
Program objectives are to evaluate the feasibility of full-system decontamination of a BWR with specific emphasis on long-term materials performance, decontamination process and system interaction, radwaste; recontamination, economics, licensing, and fuel evaluation.
- 1317 Pwr Coolant Chemistry Studies In Support Of Dose Reduction Using In-Pile Loops At Mit
Objectives are to design, construct, and operate an in-pile facility which closely simulates the PWR Primary Coolant System with respect to crud transport, temperatures, gradients, materials, etc., and to carry out experiments on the effect of coolant pH on corrosion product activity buildup.
- 1318 Solubility Measurement Of Crud And Evaluation Of Optimum Ph
To derive the optimum pH for pressurized water reactor from measurement of the solubility of crud.

- 1319 Full Reactor Coolant System (Rcs) Decontamination National Demonstration Plan
To demonstrate full reactor coolant system decontamination of operating US nuclear power plants.
- 1320 Full System Decontamination Of The Br-3 Plant
The Westinghouse PWR, in operation from 1962 to 1987 was the first PWR to be dismantled in Western Europe and was selected by the Commission of European Communities for full system decontamination.
- 1321 Future Developments In Processing Decontamination Waste
Program objectives are to reduce waste volume by removing unwanted components from the waste, and, while doing so, avoid changes of qualified decontamination processes.
- 1322 Reduction Of Critical Path Time For Bwr Recirculation System Decontaminations
Actual tasks were examined that affect critical path during Decontaminations. Time-reducing approaches are identified for each task.
- 1323 Improvements In The Lomi Decontamination Process
Examination, evaluation, and development of improvements and modifications to the LOMI process.
- 1324 Radiation Fields Trends And Control At French Pwrs
To monitor dose rate and collective dose trends at French PWRs and to develop improved dose rate and radiation field control measures.
- 1325 Weldability Of Norem For In-Situ Repair & Replacement
Among the objectives of this program was to develop a cobalt-free hardfacing alloy which can be used for in-situ repair/replacement of valve seats and other similar components and to demonstrate the ability to deposit the NOREM alloy on applicable austenitic stainless and low alloy steel substrates.
- 1326 High Ph Operation At Swedish Pwrs
Program objective was to arrive at an optimum value of pH 300 degrees C for the Ringhals 2, 3, and 4 primary coolant which would give best results for dose rate reduction, mitigation of stress corrosion cracking in alloy 600 steam generator tubing, and prevention of hydriding in guide tubes.
- 1327 Radiation Field Control By Early Boration During Shutdown At Beaver Valley Power Station
To evaluate the extent of the impact of early boration on radiation fields and to determine the optimum conditions for early boration.
- 1328 High Ph Operation In Abb Combustion Engineering Plants
Two PWRs have been selected for trials with high pH chemistry for reasons including positive results of laboratory studies, considerable success in nuclear industry with a pH of 6.9, and the pioneering work of these plants with higher pH values.
- 1329 Reactor Coolant System Shutdown Chemistry And Nickel Management At H.B. Robinson Nuclear Project
To achieve conditions necessary for the decomposition and solubilization of activated RCS corrosion products, thereby avoiding crud bursts that may lead to redeposition rather than removal by ion exchange.
- 1330 Zinc Injection At Millstone 1
To control buildup of activated corrosion products such as Co-60 on reactor water recirculation piping.
- 1331 The Effect Of Zinc On Corrosion And Dose Rate Control
To define the effect of zinc addition to a PWR primary coolant from the viewpoint of reduced PWSCC and corrosion product generation and transport.
- 1332 Tracker: An Absolute Tube-Position Detection And Tube Marking System
Among other program objectives, to develop an absolute tube position detection and tube-marking system called "TRACKER" for guidance to jumpers in nuclear steam generators during emergency shutdowns to minimize radiation exposure and avoid plug or tool positioning errors.
- 1333 Bwr Underwater Disassembly/Assembly - Wetlift 2000

- Primary objectives are to conduct BWR disassembly and assembly operations underwater; to reduce contamination and exposure; to speed operations by using remote tooling technology; to improve personnel safety; and to reduce cavity and equipment pool entries. Other objectives are to reduce critical path time; reduce exposures; improve personnel safety; reduce person-hours, and decrease decontamination.*
- 1334 Pwr Primary System Chemistry: Experience With Elevated Ph At Millstone Point Unit 3
Operation of the Ringhals PWRs in Sweden and an earlier cycle of operation at Millstone 3 showed the benefit of operating at higher pH. However, additional data were deemed necessary to determine the effects of long-term operation at higher lithium hydroxide concentrations on the performance of plant components, especially Zircaloy-clad fuel rods.
- 1335 Steam Generator Dose Rates At Babcock & Wilcox Reactors
Objectives of this project are to collect and compare dose-rate data from seven Babcock and Wilcox reactors at five utilities, and to use the data to analyze the effectiveness of various dose-reduction measures implemented at different units.
- 1336 Preconditioning Of Pwr Steam Generators To Reduce Radiation Buildup
Project objective was to examine potential passivation (preconditioning) techniques to determine which form the most stable oxides on alloys used in PWR replacement steam generators, thus reducing corrosion-product rates to the primary coolant.
- 1337 Welding Of Norem Iron-Base Hardfacing Alloy Wire Products: Procedures For Gas Tungsten Arc Welding
Objectives of this project are (1) secure metal core and homogeneous weld wire of NOREM alloys suitable for deposition by automatic gas tungsten arc welding (GTAW); (2) develop welding procedures for these wire products; and (3) measure the galling wear resistance of specimens prepared using EPRI's newly developed welding procedures.
- 1338 Endurance Tests Of Valves With Cobalt-Free Hardfacing Alloys
Develop weld procedures for the candidate alloys on 3 in. gate valves. Determine if the iron-based hardfacing alloys have wear properties matching those of cobalt-based alloys under simulated BWR conditions.
- 1339 Replacement Of Pins And Rollers In Irradiated BWR Control Blades
Design, fabricate, and demonstrate remotely operated equipment that could be used in the spent-fuel pool at BWR sites and would remove the upper pins and rollers in irradiated control blades, replacing them with stainless steel buttons.
- 1340 Secondary Hydriding Of Defected Zircaloy-Clad Fuel Rods
Examine the secondary hydriding of Zircaloy cladding in a breached LWR fuel rod and evaluate its role in the fuel rod degradation process.
- 1341 Testing Of An Organic Removal Process In BWR Radwaste Systems
Naturally occurring organic compounds, lubricating oils, and cleaning solvents are present in plant water systems but are not removed by the usual plant purification systems. A process based on ozone-ultraviolet radiation has been demonstrated to be capable of degrading and removing organics.
- 1342 Evaluation Of Reactor Pressure Vessel Head Cracking In Two Domestic BWRs
The aims of this study were: 1) determine the cause of cracking in the reactor pressure vessel top head at 2 domestic BWRs, 2) use structural analysis methods for assessing the consequences of cracking on continued top head operation.
- 1343 Relationship Of Radiation-Induced Segregation Phenomena To Irradiation-Assisted Stress Corrosion Cracking (IASCC)
Study IASCC in austenitic stainless steels and nickel base alloys by examining microstructural changes and grain boundary segregation as a function of irradiation at LWR temperatures.
- 1344 Light Water Reactor Materials And Water Chemistry Studies At Halden

- Describe the PWR and IASCC/BWR test facilities at Halden. Determine the effects of high lithium concentrations on the corrosion behavior of Zircaloy-4 in PWRs. Assess the effect of water chemistry environment on the cracking propensity of in-core structural materials commonly found in BWRs.*
- 1345 PWR In-Pile Loop Studies In Support Of Coolant Chemistry Optimization
Investigate the effects of primary coolant pH on corrosion product oxide mass and radionuclide inventories on loop component surfaces.
- 1346 The Effect Of Dissolved Oxygen In Lithiated Coolant
Determine the effect of slightly oxidizing conditions on cobalt-60 activity buildup on 403 stainless steel, carbon steel, and iron oxide pellets.
- 1347 Chemistry Parameters Influencing The Dose Rate Build-Up In BWR Plants
Discuss several parameters that are known for influencing the dose rate buildup in BWRs. These factors, including zinc chemistry, Ni/Fe ratio, oxygen concentration, and pH, are related to primary coolant chemistry with certain aspects related to the steam water cycle.
- 1348 Overview Of Activities For The Reduction Of Dose Rates In Swiss Boiling Water Reactors
Two Swiss BWRs, at Leibstadt (KKL) and Mühleberg (KKM) began to add 0.4 ppb Zn and 0.65 ppb Fe-III respectively to their feedwater. The aim of this study was to research: 1) Statistical analysis of KKL reactor water data, 2)KKL reactor water analysis during the annual shutdown and 3)autoclave tests to clarify the role of water additives on the Co-60 deposition on steel surfaces
- 1349 Operating Experience Of Japanese Improvement And Standardization BWRs And Behavior Of Radioactivity In Reactor Water
Describe the increasing concentration of radioactivity in reactor water at Japanese BWRs and the results of studies to clarify this phenomenon.
- 1350 Feedwater Iron Crud Reduction For Chinshan Nuclear Power Station
Describe the operating history of Chishan Nuclear Power Station and the methods of iron crud identification and reduction used there.
- 1351 Reactions Of Iron Crud With Metallic Ions Under BWR Water Conditions
Formation mechanisms and formation rates of $NiFe_2O_4$ and $CoFe_2O_4$ from amorphous Fe(III) hydroxide and $\alpha\text{-Fe}_2O_3$, with Ni(II) and Co(II) ions, were studied experimentally to clarify the formation of spinel oxide on BWR fuel rod surfaces.
- 1352 Decomposition Of Hydrogen Peroxide In BWR Coolant Circuit
In a BWR primary coolant circuit, the coolant flow velocities and volume-to-surface ratios at various locations are taken into account for the estimation of the decomposition rate of hydrogen peroxide in the system.
- 1353 Full Primary System Chemical Decontamination Qualification Program
Determine the technical acceptability of using certain dilute chemical solvent processes for full reactor coolant system (RCS) chemical decontamination. Two processes, CAN-DEREM and LOMI, were selected as candidates to be qualified for use in a PWR.
- 1354 Full System Decontamination And Countermeasures Against Recontamination Of The Fugen Nuclear Power Station
Describe the full system decontamination experiences and effects of endeavors against recontamination at Fugen Nuclear Power Station in Japan.
- 1355 Electrochemical Corrosion Potential Measurement With A Rotating Cylinder Electrode In 288°C Water
This study focuses on a description of the test apparatus and the effects of water flow velocity on the electrochemical corrosion potential (ECP) behavior of stainless steel in 288°C water under simulated BWR conditions.

- 1356 Effects Of Zinc Additions On The Crack Growth Rate Of Sensitized Stainless Steel And Alloys 600 And 182 In 288°C Water
The goal of this study was to evaluate the effects of 5 to 10 ppb Zn²⁺ addition on the stress corrosion crack growth rates of sensitized Alloy 600 using 25 mm compact type specimens, and sensitized type 304 stainless steel and Alloy 182 weld metal using double cantilever beam specimens.
- 1357 On-Line Measurement Of Particles In Reactor Water Of BWRs
Measure the number, size, and composition of particles in the primary cooling water of a BWR.
- 1358 The Integrity Of Inconel Alloys In High Temperature Water Chemistry
Investigate the electrochemical behavior of nickel-based alloys using potentiodynamic technique in sulfate and/or chloride environments at 316°C.
- 1359 Enriched Boron Products
Document the usefulness of enriched boron products in nuclear power plants, specifically enriched boric acid at PWRs and enriched sodium pentaborate at BWRs.
- 1360 Variabilities In The Calculation Of PWR Primary Coolant pH
pH values vary greatly with temperature and can vary significantly with different methods of calculation. In this paper, these variations are quantified in order to aid cross-comparison of literature values.
- 1361 Construction And Operation Of An In-Pile Loop For BWR Coolant Chemistry Studies
Discusses the construction and operation at the MIT Research Reactor of an in-pile loop which simulates BWR coolant conditions. The loop was designed to carry out coolant radiolysis studies, with a focus on O₂ and H₂O₂ generation, electrochemical corrosion potential, and N-16 chemistry.
- 1362 Water Chemistry During The Shut-Down Of The Boiling Water Reactor Leibstadt
In order to better understand the reasons for activity increase in reactor water during shut-down, an extensive measuring campaign was carried out during the shut-down of the BWR Leibstadt.
- 1363 Solubility Of Cobalt In Primary Circuit Solutions
The solubility of cobalt ferrite (CoFe₂O₄) was measured in PWR primary circuit conditions in the temperature range 250-350°C. The results were compared with the ones obtained on magnetite and nickel ferrite.
- 1364 Statistical Analysis Of Reactor Water Data
To show that regression analysis is a simple tool to get an idea of which impurities in a reactor are important for the transport and deposition of Co-60 for further mechanistical studies.
- 1365 Mixed Oxide-Alloy-Water Systems Under LWR Conditions
To calculate the potential-pH diagrams for Fe-Cr-Ni alloys and for Fe-Zn systems, showing the regions of stability for mixed oxides.
- 1366 Maximum Allowable Chloride Levels On Stainless Steel Components At The Sizewell "B" PWR
Assess the environmental conditions and chloride contamination levels under which corrosion (stress corrosion cracking, intergranular attack, and pitting) could occur at the Sizewell "B" PWR.
- 1367 Inorganic Seed Materials For The Decontamination Of PWR Aqueous Wastes
Study the use of several inorganic sorbents, used in combination with crossflow membrane filtration, for the reduction of Cr-51 and Sb-125 levels in a PWR waste stream.
- 1368 Easy Inexpensive Hydrogen Water Chemistry Predictive Methods
This paper describes inexpensive and simple hydrogen water chemistry (HWC) predictive methods that eliminate the need for HWC minitests.
- 1369 Potential-pH Diagrams For Alloy-Water Systems Under LWR Condition

To calculate from thermodynamic data the regions of oxide compound stability (Pourbaix diagrams) for the water-Fe-Cr-Ni system at room temperature and at typical LWR temperature. Diagrams for Fe-Cr-water, Fe-Ni-water, and Cr-Ni-water systems are also given.

- 1370 In-Pile Loop Studies Of Close Reduction Technologies For PWRs And BWRs; Investigations Of Material Susceptibility To Cracking
The objectives are: 1) For BWRs, reduce N-16 carryover by optimizing chemistry, 2) For PWRs, reduce radioactive corrosion product build up on the primary cooling surface by pH optimization of the water chemistry 3) Reduce irradiation assisted stress corrosion cracking on core structural materials.
- 1371 Evaluation Of Factors Affecting Radiation Field Trends In Westinghouse-Designed Plants
Quantify the effects of cobalt input variations, operational chemistry, steam generator replacements, and decontamination on plant dose rates.
- 1372 The Mechanics And Kinetics Of Corrosion Product Release From Carbon Steel In Lithiated High Temperature Water
A Formulation of the Cobalt Release from Carbon Steel.
- 1373 Investigation Of The Chemical And Physical Properties Of Spinel Oxides
To determine the affinity of various corrosion product spinels to the oxide layers formed by corrosion product release in high temperature water.
- 1374 Overview Of The Impact Of Stellite Removal On Radiation Fields In KWU PWRs
Determine the following based upon data from Siemens PWRs: 1) the effect of a progressive reduction in Stellite on radiation fields, 2) the consequences of replacing Inconel 718 gridded fuel by Zircaloy, 3) the effect of eliminating antimony from the main coolant pump bearing, 4) the effect of an increase in the pH of the primary coolant.
- 1375 Activity Transport And Corrosion Processes In PWRs
Outline current understanding of activity processes in PWRs.
- 1376 Feasibility Of On-Line Monitoring Of Stress Corrosion Cracking In Rotating Components
To demonstrate the feasibility of sending electrochemical signals telemetrically between an instrumented stress corrosion cracking (SCC) specimen and a data acquisition system.
- 1377 Concept And Experience Of System Decontamination With CORD
Outline the Siemens concept for the decontamination of systems with the CORD process. The results of sub-system and full-system decontaminations of a PWR and a BWR is presented.