



July 19, 2000
LIC-00-0066

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, DC 20555

Reference: Docket No. 50-285

SUBJECT: Transmittal of Changes to Fort Calhoun Station Radiological Emergency Response Plan (RERP)

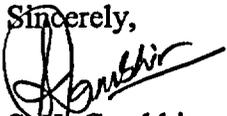
In accordance with 10 CFR 50 Appendix E Part V and 10 CFR 50.4(b)(5)(iii), please find an RERP change package enclosed for the Document Control Desk (holder of Copy 165) and three (3) sets for the NRC Emergency Response Coordinator (holder of Copies 154, 155, and 156).

The document update instructions and summary of changes are included on the Confirmation of Transmittal (Form EP-1) attached to each controlled copy change package. Please return the Confirmation of Transmittal forms by August 30, 2000.

The revised documents included in the enclosed packages are:

RERP Index Pages 1&2 issued 06/29/00
RERP R15 issued 06/29/00

Please contact me if you have any questions regarding the enclosed changes.

Sincerely,

S. K. Gambhir
Division Manager
Nuclear Operations

SKG/BRH/dls

Enclosures

c: T. H. Andrews, Emergency Response Coordinator (3 sets)
L. R. Wharton, NRC Project Manager (w/o enclosures)
W. C. Walker, NRC Senior Resident Inspector (w/o enclosures)
Winston & Strawn (w/o enclosures)

A045

**RADIOLOGICAL EMERGENCY RESPONSE PLAN INDEX
RERP**

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RERP-SECTION B	Organizational Control of Emergencies	R24 02-29-00
RERP-SECTION C	Emergency Response Support and Resources	R9 09-30-98
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RERP-SECTION F	Emergency Communications	R14 09-09-99
RERP-SECTION G	Public Education and Information	R10 03-11-97a
RERP-SECTION H	Emergency Facilities and Equipment	R28 02-29-00
RERP-SECTION I	Accident Assessment	R11 09-02-99
RERP-SECTION J	Protective Response	R16 01-06-00
RERP-SECTION K	Radiological Exposure Control	R9 02-03-00
RERP-SECTION L	Medical and Public Health Support	R11 01-27-00
RERP-SECTION M	Recovery and ReEntry Planning and Post Accident Operations	R14 03-11-97a
RERP-SECTION N	Exercises and Drills	R12 10-28-99
RERP-SECTION O	Radiological Emergency Response Training	R13 09-23-97a
RERP-SECTION P	Responsibility for the Planning Effort: Development, Periodic Review and Distribution	R10 10-23-97

**RADIOLOGICAL EMERGENCY RESPONSE PLAN INDEX
RERP**

<u>PROCEDURE NUMBER</u>	<u>TITLE</u>	<u>REVISION/DATE</u>
RERP-APPENDIX A	Letters of Agreement	R16 03-07-00
RERP-APPENDIX B	Supporting Emergency Plans	R4 10-27-98
RERP-APPENDIX C	NUREG/RERP/Implementing Procedure Cross Reference List	R12 09-02-99
RERP-APPENDIX D	OPPD Resolution #4731, Radiological Emergency Response Plan Authority	R2 09-30-98

Fort Calhoun Station
Unit No. 1

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RERP

RADIOLOGICAL EMERGENCY RESPONSE PLAN.

Title: DEFINITIONS AND ABBREVIATIONS

FC-68 Number: DCR 11805

Reason for Change: Add reference to National Weather Service as Activator of EAS.

Requestor: M. Reller

Preparer: M. Reller

DEFINITIONS AND ABBREVIATIONS

1. ABB-CE - ABB, Combustion Engineering, Inc.
2. AIF - Atomic Industrial Forum
3. ALARA - (As Low As Reasonably Achievable) - The level at which OPPD strives to maintain personnel radiation exposure.
4. ALNOR - A brand name of electronic dosimetry utilized at the Fort Calhoun Station.
5. ANI - American Nuclear Insurers
6. AOP - Abnormal Operating Procedures
7. ASSESSMENT ACTIONS - The appropriate actions taken during or following an accident evaluation before implementing the specific corrective and/or protective actions.
8. CE - ABB, Combustion Engineering, Inc.
9. CDE - Committed Dose Equivalent (typically to a specific organ)
10. CEDE - Committed Effective Dose Equivalent
11. CET - Core Exit Thermocouple
12. CFR - Code of Federal Regulations
13. CFS - Cubic Feet per Second
14. CHP - Conference Health Physics Network
15. COP - Conference Operations Network
16. CONTROL ROOM - The onsite location from which the Fort Calhoun Station nuclear power plant is operated.
17. CORRECTIVE ACTIONS - Emergency measures taken to correct or mitigate an emergency condition at its origin in order to prevent an uncontrolled release of radioactive material or to reduce the magnitude of a release.
18. CR - Control Room

19. ΔT - Delta Temperature - The difference in temperature between points 10 meters and 60 meters above the ground in units of centigrade. The value displayed on the ERFCS equates to;
$$100m \Delta T = [(T @ 60m - T @ 10m) \times 2].$$
20. DDE - Deep Dose Equivalent (typically a dose received from a high penetrating form of radiation).
21. DOE - Department of Energy
22. DRILLS - A drill is a supervised instruction period aimed at testing, developing and maintaining skills in a particular ERO position, function, center, or operation. A drill can be used as a component of a larger exercise.
23. D/Q - Deposition Factor
24. DSO - Director of Site Operation
25. EAL - Emergency Action Levels - Alarms, instrument readings or visual sightings that have exceeded predetermined limits which would categorize the situation into an initiating condition of one of the four Emergency Classifications. (see EPIP-OSC-1 for specifics).
26. EAGLE - Emergency Assessment of Gaseous & Liquid Effluents.
27. EAS - (Emergency Alerting System) - A predesignated network of radio stations whose purpose is to pass emergency information throughout a designated geographical area. Radio station KFAB (1110 KHz) is the primary control station for the Fort Calhoun Station and surrounding communities.
28. ECCS - Emergency Core Cooling System
29. ENS - Emergency Notification System
30. EOC - Emergency Operation Center
31. EOF - Emergency Operation Facility
32. EOP - Emergency Operating Procedures
33. EPA - Environmental Protection Agency
34. EPIP - Emergency Plan Implementing Procedures
35. EPRI - Electrical Power Research Institute

36. EPT - Emergency Planning Test
37. EPZ - Emergency Planning Zone
38. ERDS - Emergency Response Data System, a system which electronically transmits key plant parameters from the station to the NRC during an emergency condition.
39. ERF - Emergency Response Facilities
40. ERFCS - Emergency Response Facilities Computer System
41. ERMS - Emergency Response Message System
42. ERO - Emergency Response Organization
43. EXCLUSION AREA - The area surrounding a nuclear power plant in which the reactor licensee has the authority to determine all activities including exclusion or removal of personnel and property from that area. The term is synonymous with "onsite".
44. EXERCISE - An emergency preparedness exercise is an event that tests the integrated capability and major portion of the basic elements existing within the Radiological Emergency Response Plan (RERP), associated Emergency Plan Implementing Procedures (EPIPs) and the various organizations associated with the implementation of the RERP. Typically, an emergency preparedness exercise shall simulate an emergency that results in offsite radiological releases which would require response by offsite authorities.
45. FAA - Federal Aviation Administration
46. FAX - Emergency Assessment Facsimile
47. FCP - Forward or Field Command Post
48. FCS - Fort Calhoun Station
49. FEMA - Federal Emergency Management Agency
50. FOL - Forward Operation Location
51. FSAR - Final Safety Analysis Report, now a historical document.
52. FTS -Federal Telecommunications System (NRC Phone Circuits)
53. GAR - Governor's Authorized Representative

54. GCPM - Gross Counts per Minute
55. HEPA - High Efficiency Particulate Air filter
56. HHS - Health and Human Services
57. HPN - Health Physics Network
58. HVAC - Heating, Ventilation, and Air Conditioning
59. INPO - Institute of Nuclear Power Operations
60. IPZ - Ingestion Pathway Zone
61. KFAB - An A.M. radio station that serves as the Local Primary (LP1) Emergency Alerting System station for emergencies at the Fort Calhoun Station.
62. MUD - Metropolitan Utilities District
63. MRC - Media Release Center
64. NAWAS - National Warning System.
65. NHS - Nebraska Health System University Hospital, located in Omaha, it provides medical aid in Radiological Emergencies and serves as an independent subject matter expert at the MRC, through its Radiation Health Center.
66. NSP - Nebraska State Patrol
67. NRC - Nuclear Regulatory Commission
68. NSSS - Nuclear Steam Supply System
69. NWS - National Weather Service - Activates the EAS signal which is picked up by the Local Primary 1 EAS station for broadcast in the affected area. Other broadcasters in the area may also pickup and transmit the signal if they desire.
70. OPPD - Omaha Public Power District - Also referred to as the "licensee".
71. OSC - Operations Support Center

72. **PAG** - (Protective Action Guide) - The Protective Action Guide is a set of radiological dose values for the general population that warrant protective action following an uncontrolled release of radioactive material. The PAG's are established in the "Manual of protective Action Guides and Protective Actions for Nuclear Incidents, EPA 400-R-92-001. May 1992".
73. **PAR** - (Protective Action Recommendations) - Recommendations regarding protective actions to be taken to safeguard the public.
74. **PASS** - Post Accident Sampling System
75. **PING** - Particulate, Iodine, and Noble Gas monitor
76. **Protective Actions** - Emergency measures taken following a release of radioactive material in order to prevent or minimize the radiological exposures to individuals.
77. **PWR** - Pressurized Water Reactor
78. **QA** - Quality Assurance
79. **QC** - Quality Control
80. **QSPDS** - Qualified Safety Parameter Display System.
81. **RCS** - Reactor Coolant System
82. **REM** - Roentgen Equivalent Man: unit of dose of any ionizing radiation that produces the same biological effect as a unit of absorbed dose of ordinary X-rays.
83. **RERP** - Radiological Emergency Response Plan
84. **RERT** - Radiological Emergency Response Team
85. **RMS** - (Radiation Monitoring System) - Area and process radiological instrumentation within the station.
86. **SARC** - Safety Audit and Review Committee
87. **SB** - Site Boundary
88. **SCBA** - Self Contained Breathing Apparatus
89. **SCFM** - Standard Cubic Feet per Minute
90. **SDE** - Shallow Dose Equivalent (typically dose received to the skin)

91. Site Director - The person responsible for all onsite activities and offsite actions until the Emergency Director position is established.
92. Site North - General term used to define the direction within the plant of the walls near the north side of the plant. True north is slightly northeast of Site North.
93. SPDS - Safety Parameter Display System
94. SRD - Self Reading Dosimeter
95. TEDE - Total Effective Dose Equivalent (a measurement of total body burden from receiving a dose externally and internally - replaces "Whole Body" as the key dose limit)
96. TLD - (Thermoluminescent Dosimeter) - A device normally used by plant personnel to measure the amount of radiation received.
97. TSC - Technical Support Center
98. UPS - Uninterruptable Power Supply
99. USAR - (Updated Safety Analysis Report) - An active document evaluating plant systems.
100. WB - Whole Body

AREA DESCRIPTION

1. PLANT LOCATION

Fort Calhoun Station is located midway between Fort Calhoun and Blair, Nebraska, on the west bank of the Missouri River. The site consists of approximately 660.46 acres with an additional exclusion area of 582.18 acres on the northeast bank of the river directly opposite the plant buildings. The distance from the reactor containment to the nearest site boundary is approximately 910 meters; and the distance to the nearest residence is beyond the site boundary. Except for the city of Blair and the villages of Fort Calhoun and Kennard, the area within a ten mile radius is predominantly rural. The land use within the ten mile radius is primarily devoted to general farming. There are no private businesses or public recreational facilities on the plant property. The DeSoto National Wildlife Refuge occupies approximately 7821 acres east of the plant site. This area is open to the public for day use year around. Visitors to the refuge generally use areas from two to five miles from the plant. Estimates by the U.S. Fish and Wildlife Service place annual usage of the facility at approximately 120,000 for the Visitors Center and 400,000 for the refuge. The expected maximum daily usage of the facility has been placed at 2500 visitors for a winter weekday and 5000 on a summer weekend. The Boyer Chute Federal Recreation Area is a day use facility occupying approximately 2000 acres southeast of the plant site. Visitors to the recreation area generally use areas seven to ten miles from the plant. The estimates for annual usage of this facility is approximately 50,000 visitors.

The State of Nebraska operates the Fort Atkinson State Historic Park five and half miles southeast of the plant site. This day use facility is mostly seasonal and estimates place annual usage at 60,000. The State of Iowa maintains Wilson Island State Park with 275 camping spaces south of the DeSoto National Wildlife Refuge and four miles southeast of the plant site. The estimates for usage of this facility range from 500 on a winter weekday to 1000 on a summer weekend.

Two private facilities lie to the north of the plant along the Missouri River. The Cottonwood Marina is located approximately four and a half miles from the plant. Estimates place summer weekend usage at 200 people. Timbers at Rivers Edge is a private campground lying directly south of Cottonwood Marina and ranging from four to four and a half miles from the plant. The campground has approximately 235 campsites and is open from April to October.

2. AREA INDUSTRIES

A listing of various industries located within a ten mile radius of the Fort Calhoun Station, including firm name, product, number of employees, and location from the plant site is contained in the Updated Safety Analysis Report.

AREA DESCRIPTION

3. AREA WATER SUPPLIES

Local public drinking water supplies are not taken from the Missouri River in this area. The first downstream intake is the city of Omaha approximately 19.5 miles downstream. Industrial water use is limited to cooling purposes in the Omaha area. Drinking water near the Fort Calhoun Station is obtained from either well or reservoirs. Since the known public and private water supplies originate at elevations higher than the river, radioactive liquids that might be discharged from the plant into the river should not contaminate these supplies.

There are also many private wells in the region which draw primarily upon ground water rather than on springs or other surface sources. Several marinas are located along the Missouri River, between 3 miles upstream from Blair and Omaha, 18 miles downstream. In the event of a significant waterborne release incident from the Fort Calhoun Station, the Nebraska Department of Environmental Control acting in conjunction with the Nebraska Department of Health, Division of Radiological Health and the U. S. Coast Guard are prepared to notify all downstream users of Missouri River water. Notification is made through OPPD management directly to the Metropolitan Utilities District (MUD) in the event of an inadvertent liquid release to the river. Swimming, boating and other recreational activities involving river water can be controlled by the Coast Guard until adequate surveys have been taken to determine when normal activities may be resumed.

PURPOSE OF THE EMERGENCY PLAN

The purpose of the Fort Calhoun Station "Radiological Emergency Response Plan" (RERP) is to delineate an organization for coping with emergencies, to classify emergencies according to severity, define and assign responsibilities and authorities, and to clearly outline the most effective course of action and protective measures required to mitigate the consequences of an accident and to safeguard the public and station personnel in the event of an incident. The Emergency Plan Implementing Procedures (EPIP's), Radiation Protection procedures, Emergency Operating procedures and other station references are available at the plant to further assist personnel for operating during abnormal occurrences. The various emergency procedures are put into effect whenever a system, component or circuit failure could lead to a personnel hazard or major equipment failure. Emergency Operating Procedures are sufficiently detailed so that the plant is placed, as expeditiously as possible, in a safe condition. The various procedures include such items as radiation hazards, weather conditions and availability of technical and operating personnel.

ACCIDENT CONSIDERATIONS

1. FUEL HANDLING ACCIDENT

The possibility of an incident during fuel handling is unlikely due to the many physical limitations imposed on fuel handling operations and systems. In addition, administrative restrictions placed on fuel handling procedures provide greater control. Nevertheless, the offsite consequences of dropping a spent fuel assembly and breaking 14 fuel rods have been evaluated and are documented in the Fort Calhoun Station, Unit No. 1 USAR. Emergency onsite and offsite monitoring practices would begin immediately following the accident to determine actual consequences, and appropriate emergency actions would be taken. Emergency procedures addressing a Fuel Handling Incident provide emergency actions for this mishap.

2. FIRES

2.1 Internal Plant Fires (within the Protected Area)

Internal Plant fires are normally handled by the station's Fire Brigade, comprised of trained individuals from the Operations, Chemistry, Radiation Protection and Security Departments. All efforts are made to prevent the spread of airborne contamination should the fires occur within the Radiological Controlled Area.

2.2 External Fires (outside the Protected Area)

External fires are controlled by local fire department response. In the event high airborne contamination constitutes a possible hazard to areas outside of the protected area, offsite survey teams/personnel can be dispatched immediately.

ACCIDENT CONSIDERATIONS

3. EXPLOSION

Because of the accumulation of waste gases in the waste gas decay tanks, the possibility and consequences of an explosion have been considered. An explosion could result in an unexpected, uncontrolled release to the atmosphere of radioactive fission gases that were stored in the waste gas system. A failure of any of the waste gas decay tanks or associated piping could also result in a release of gaseous activity. The noble gases stored in the tanks would diffuse and become diluted during their transport to the site boundary. The projected Deep Dose Equivalent (DDE) at the exclusion area boundary would be less than 1.0 Rem. This conservative analysis is based upon 1% fuel cladding defects, and accumulation of all noble gases without release over a full core cycle. Emergency procedures addressing a Waste Gas Incident, would be placed into effect immediately and offsite monitoring teams would be dispatched downwind.

4. TOXIC CHEMICAL RELEASE ACCIDENTS

The primary toxic chemical release accidents which may result in toxic gas concentrations at Fort Calhoun Station are shown below:

<u>TOXIC CHEMICAL</u>	<u>ACCIDENT</u>
Ammonia (NH ₃)	Rupture of two 25,000 ton offsite refrigerated tanks.
Ammonia	Rupture of two 30,000 gal. offsite non-refrigerated tanks.
Ammonia	Rupture of a 78 ton railroad tank car.
Ammonia	Rupture of a 2 ton tank truck.

The above accidents will not pose a hazard to control room personnel, due to toxic gas monitors located at the fresh air intake of the control room, which isolates the control room before the gases reach the toxic limit. The stringent odor of ammonia makes station personnel immediately aware of any leakage or toxic gas cloud.

ACCIDENT CONSIDERATIONS

4. (Continued)

The toxic gas monitors sample for NH_3 and continuously monitor the fresh air to the control room during normal plant operations.

At different phases of plant operation, Hydrogen and/or Nitrogen gases blanket the volume control tank and the waste gas system. Considering that the deleterious effect of these gases is the exclusion of oxygen, a release to the atmosphere diminishes the harmful effect and a serious hazard is eliminated.

In the event of an offsite accidental release of chemicals, within a five (5) mile radius of the Fort Calhoun Station, the Blair Fire Department emergency procedures requires notification to the Fort Calhoun Station. The counties of Washington (Nebraska) and Harrison (Iowa) have agreed to notify the Fort Calhoun Station when hazardous chemical accidents occur within five miles of the station. The Blair Industrial Park Co-Op, emergency notification system is an organization of industries, including Fort Calhoun Station that have banded together to form a warning system to notify the member industries and the Washington County Dispatch center of a potential or actual event occurring at a member facility. Appropriate action is taken, especially in the control room, to ensure that air remains breathable. For long duration toxic accidents, six (6) hours of compressed air is available for five (5) control room operators coupled with provisions to obtain additional air within this time period.

5. MAJOR STEAM RELEASE

The offsite consequences of a steam line rupture incident has been evaluated and is documented in the Fort Calhoun Station, Unit NO. 1 USAR. The maximum size steam line rupture is a circumferential double-ended rupture of the 36-inch main steam header. The analysis of this incident at the site boundary is calculated to be 0.9 Rem total whole body exposure. Plant personnel would be protected by normal health physics practices and procedures. Operator action follows the emergency procedures addressing a Steam Line Rupture with Loss of Offsite Power.

6. PERSONNEL INJURY

A fully stocked First Aid Room is available in the Plant. Immediate and temporary care may be given to the injured person using standard First Aid practices. If the injury involves contamination, efforts to decontaminate the injured person to reasonable levels are made prior to transfer to the First Aid Room or to offsite medical facilities. If decontamination is not practical, the injured person is covered in such a manner as to minimize the spread of contamination until either medical aid can be obtained or until the injured person can be transported to the NHS University Hospital Radiation Health Center.

7. NATURAL DISASTERS

ACCIDENT CONSIDERATIONS

A natural disaster may occur which could initiate any of the accidents previously discussed. The reactor may be placed in a shutdown condition, depending upon the anticipated or experienced severity of the disaster.