I. PURPOSE

The purpose of this procedure is to provide a means of classifying an event at CNS into one of four emergency classifications as described in the CNS Emergency Plan.

II. DISCUSSION

A. INTRODUCTION TO THE MODULAR CONCEPT

1. THE BASIC MODULE

a. Four classes of Emergency Action Levels have been established. The classes are:

1) NOTIFICATION OF UNUSUAL EVENT
2) ALERT
3) SITE AREA EMERGENCY
4) GENERAL EMERGENCY

b. The rationale for these classes is to provide early and prompt notification of minor events (the "BASIC MODULE EVENTS") which could lead to more serious consequences, or which might be indicative of more serious conditions which are not yet fully realized. A system of "modules" has been provided to ensure more effective response preparation for more serious indicators.

c. There are four Basic Modules which depict the four major types of events.

1) Radiological
2) Operational
3) Fire-Natural-Security
4) Miscellaneous

d. The Basic Modules are subdivided into 14 submodules that are abnormal conditions considered to be those initiating events upon which all emergencies categorized within the Emergency Action Levels are based.

e. Prompt recognition of the occurrence of one or more of these initiating events of the Basic Module may prevent the situation from progressing to either a NOTIFICATION OF UNUSUAL EVENT category or an Action Level of greater severity.

f. The 14 submodule events are:

1) Release of radiological liquid or gaseous effluent in excess of Technical Specification limits or abnormal radiation levels.

2) Indications leading to or actual loss of fission product barrier.

3) Steam line break or main steam safety or relief valve failure.

4) Primary reactor coolant leak

5) Loss of power or alarms

6) Other limiting conditions for operations

7) Reactor Protection System failure

8) Fuel handling accident

9) Control Room evacuation

10) Fire

11) Security threat

12) Natural phenomena

13) Other hazards

14) Events which require prompt notification of offsite agencies.

g. As can be seen from Attachment A, an emergency (initiating condition), may progress to a particular Emergency Action Level as a result of a combination of one or more of the Submodule events. In most instances, these elements of the Submodule will advance to the category of a NOTIFICATION OF UNUSUAL EVENT, and, with continued degradation, could escalate to the more severe classes of ALERT, SITE AREA EMERGENCY, or GENERAL EMERGENCY.

h. The question may arise as to "What is meant by a 'modularized' system of the Emergency Action Levels?". As shown in Attachment A, each of the four classes of the Emergency Action Levels is indicative of nine or more sets of initiating conditions.

The events within each class are either identical to, or are slight modifications of, those that exist in Chapter 4 of the CNS Emergency Plan. What the "modularized" system denotes is a graphic reproduction of

Tables 4 1-1 through 4.1-4, in an easy-to-read and understand, readily available "flowchart" format. This modular format yields three important advantages:

1) It affords prompt recognition of an emergency action condition and an indication of its severity as defined by the Emergency Action Levels.

2) Prompt recognition leads to prompt action as well as an accelerated process of initial notification and activation of onsite and offsite agencies.

3) It enables the reactor operations personnel to effectively move through the emergency procedures and into the EPIPs.

i. The utilization of the "modular" approach in assessing a radiological accident, affords greater probability of responding to a potentially hazardous occurrence in a more timely manner, and time is an important factor in dealing with all emergency situations.

III. REFERENCE MATERIAL

A. Cooper Nuclear Station Emergency Plan

B. NUREG-0654, Rev 1.

IV. PREREQUISITES

A. An Emergency Operation Procedure has been initiated.

B. An unusual occurrence has taken place at or near the site.

V. LIMITATIONS

A. The steps required by this procedure are in addition to the steps required to maintain or restore the station to a safe condition.

B. If conflicts in personnel assignments or sequence of actions arise, first priority will be given to maintaining or restoring the station to a safe condition.

VI. PRECAUTIONS

None

VII. EQUIPMENT

None

VIII. PROCEDURE

A. Classifications

1. Shift Supervisor/Emergency Director selects affected submodules on Classification Checklist (Attachment B) related to station events or conditions and records the date and time of initial classification.

2. For all submodules selected on Attachment B; Shift Supervisor/Emergency Director is to refer to the Classification Guide (Attachment C) and review initiating conditions for emergency classification.

3. Shift Supervisor/Emergency Director records the emergency classification.

4. The Accident Classification Flowchart (Attachment A) is a tool designed to assist selecting the appropriate portion of the Classification Guide (Attachment C). The Accident Classification Guide Flowchart indicates graphically, for certain combinations of station conditions, which basic module in the guide contains the Initiative Conditions, EALs, and classification levels.

   a. In the Submodule column, are listed 14 abnormal conditions that are considered to be those initiating events upon which all emergencies are based. By following a vertical path down this column to the applicable condition and then horizontally across the sheet to the actual event, the Shift Supervisor/Emergency Director can promptly recognize an emergency classification.

5. Shift Supervisor/Emergency Director initiates the appropriate Emergency Plan Implementing Procedure as follows:

   a. NOTIFICATION OF UNUSUAL EVENT - EPIP-5.7.2
   b. ALERT - EPIP-5.7.3
   c. SITE AREA EMERGENCY - EPIP-5.7.4
   d. GENERAL EMERGENCY - EPIP-5.7.5

B. Reclassification

1. An emergency may escalate to a higher classification as station conditions worsen or additional abnormal station conditions arise. This could also happen as a result of a combination of two or more of the Submodule events.

2. An emergency may be initially classified at one level and, upon further investigation or after corrective actions, may be reclassified to a less severe class of emergency.

3. Compare the Emergency Action Levels on Attachment C and station conditions and, when necessary, reevaluate the classification as in Section A.

4. Record the most severe emergency classification and date/time.

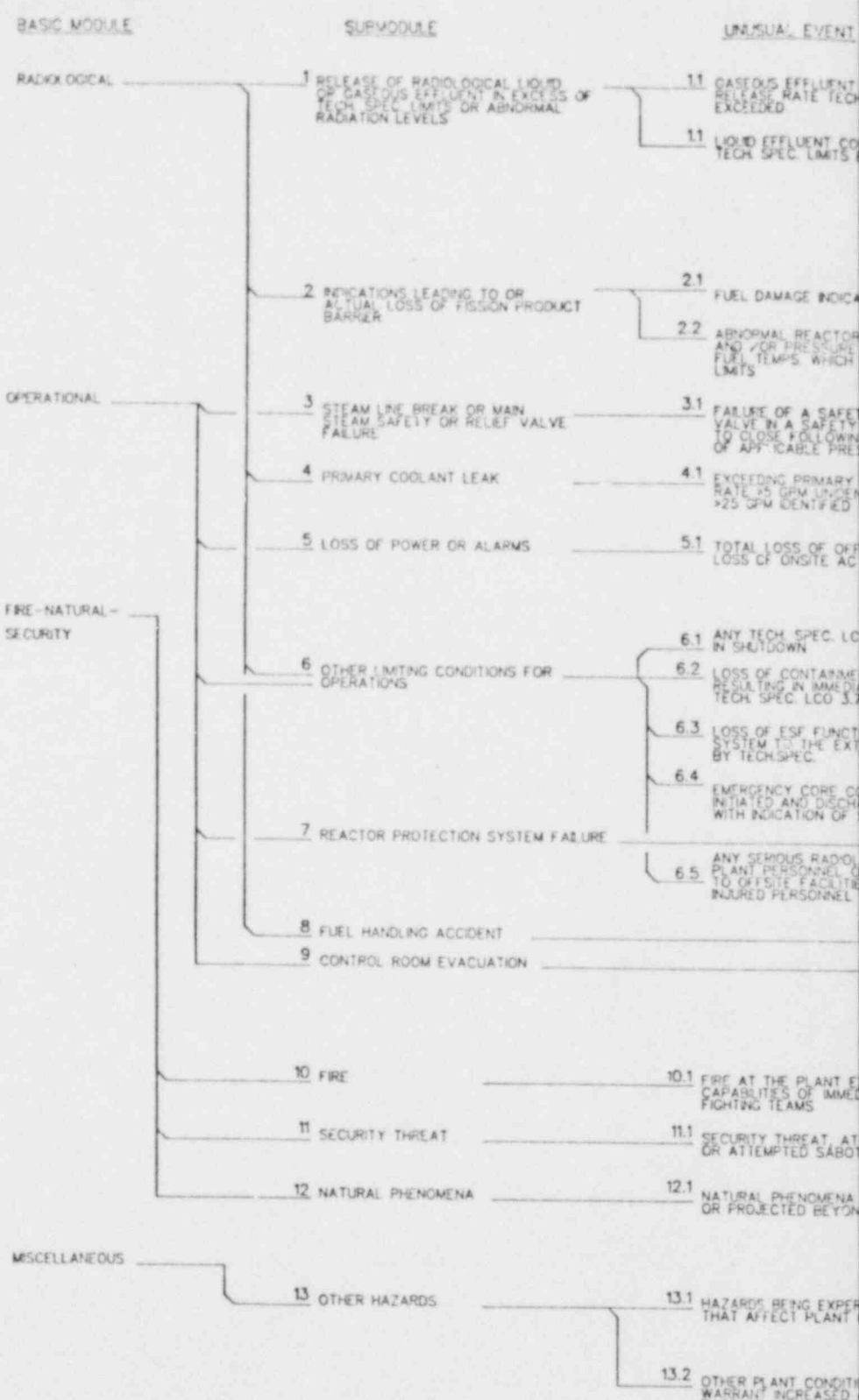
IX. ATTACHMENTS

Attachment A, "Accident Classification Guide Flowchart"

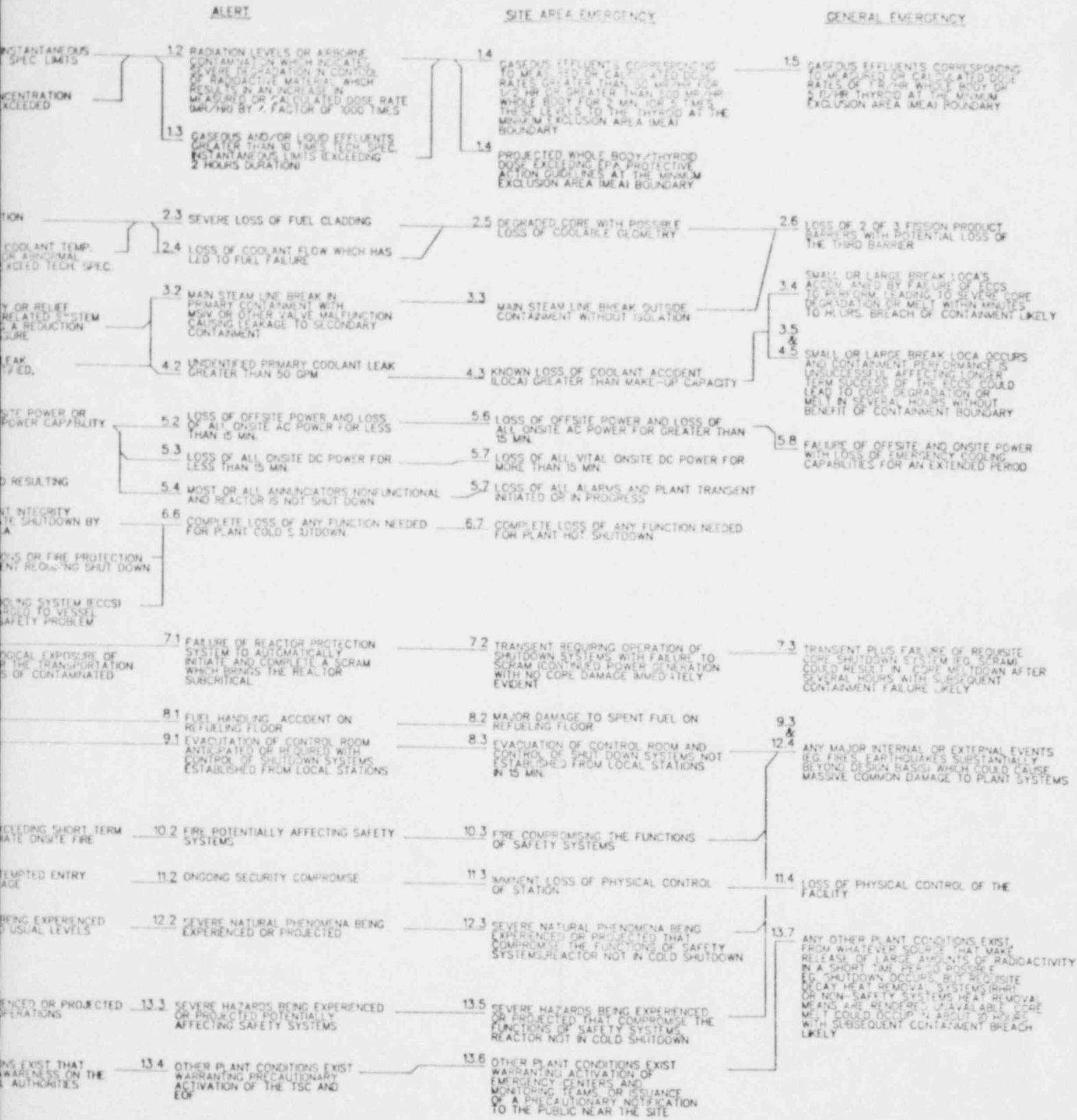
Attachment B, "Classification Check List"

Attachment C, "Classification Guide"

ACCIDE


BASIC MODULE
SUBMODULE
UNUSUAL EVENT
RADIOLOGICAL
1 RELEASE OF RADIOLOGICAL LIQUID OR GASEOUS EFFLUENT IN EXCESS OF TECH. SPEC. LIMITS OR ABNORMAL RADIATION LEVELS
1.1 GASEOUS EFFLUENT RELEASE RATE TECH EXCEEDED
1.1 LIQUID EFFLUENT CO TECH. SPEC. LIMITS
2 INDICATIONS LEADING TO OR ACTUAL LOSS OF FISSION PRODUCT BARRIER
2.1 FUEL DAMAGE INDICA
2.2 ABNORMAL REACTOR AND / OR PRESSURE FUEL TEMPS. WHICH LIMITS
OPERATIONAL
3 STEAM LINE BREAK OR MAIN STEAM SAFETY OR RELIEF VALVE FAILURE
3.1 FAILURE OF A SAFET VALVE IN A SAFETY TO CLOSE FOLLOWIN OF APPLICABLE PRE
4 PRIMARY COOLANT LEAK
4.1 EXCEEDING PRIMARY RATE 25 GPM UNDEN >25 GPM IDENTIFIED
5 LOSS OF POWER OR ALARMS
5.1 TOTAL LOSS OF OFF LOSS OF ONSITE AC
FIRE - NATURAL - SECURITY
6 OTHER LIMITING CONDITIONS FOR OPERATIONS
6.1 ANY TECH. SPEC. LC IN SHUTDOWN
6.2 LOSS OF CONTAINME RESULTING IN IMMEDI TECH. SPEC. LCO 3.7
6.3 LOSS OF ESF FUNCT SYSTEM TO THE EXT BY TECH.SPEC.
6.4 EMERGENCY CORE C INITIATED AND DISCH WITH INDICATION OF
7 REACTOR PROTECTION SYSTEM FAILURE
6.5 ANY SERIOUS RADIOL PLANT PERSONNEL O TO OFFSITE FACILITI INJURED PERSONNEL
8 FUEL HANDLING ACCIDENT
9 CONTROL ROOM EVACUATION
10 FIRE
10.1 FIRE AT THE PLANT E CAPABILITIES OF IMME FIGHTING TEAMS
11 SECURITY THREAT
11.1 SECURITY THREAT, AT OR ATTEMPTED SABOT
12 NATURAL PHENOMENA
12.1 NATURAL PHENOMENA OR PROJECTED BEYON
MISCELLANEOUS
13 OTHER HAZARDS
13.1 HAZARDS BEING EXPER THAT AFFECT PLANT
13.2 OTHER PLANT CONDITI WARRANT INCREASED PART OF STATE/LOCA

COOPER NUCLEAR STATION
NT CLASSIFICATION GUIDE FLOWCHART



ACCIDENT CLASSIFICATION GUIDE FLOWCHART

EPIP 5-[illegible]
ATTACHMENT A

ATTACHMENT B - CLASSIFICATION CHECKLIST

SUBMODULE		INITIAL CLASSIFICATION/ DATE/TIME	SUBSEQUENT CLASSIFICATION/ DATE/TIME	SUBSEQUENT CLASSIFICATION/ DATE/TIME	SUBSEQUENT CLASSIFICATION/ DATE/TIME	REFER TO ATTACHMENT C PAGE(S)
1.	Release of radiological liquid or gaseous effluent in excess of Tech. Spec. limits or abnormal radiation levels.					1, 2
2.	Indications leading to or actual loss of a fission product barrier.					2, 3, 4
3.	Steam line break or safety or relief valve failure.					4, 5
4.	Primary reactor coolant leak.					6, 7, 8
5.	Loss of power or alarms.					8, 9
6.	Other limiting conditions for operation.					10, 11
7.	Reactor Protection System failure.					11
8.	Fuel Handling accident.					12
9.	Control room evacuation.					12, 13
10.	Fire.					13
11.	Security threat.					13
12.	Natural phenomena.					14
13.	Other hazards.					15, 16

ATTACHMENT C - CLASSIFICATION GUIDE

SUBMODULE	INITIATING CONDITIONS	EMERGENCY ACTION LEVELS	EMERGENCY CLASS
1. Release of radiological liquid or gaseous effluent in excess of Technical Specifications limits	1.1 Radiological effluent technical specification limits exceeded.	1.1.1 Based on 10CFR20 Appendix B, Table II, Column 2 Monitored by: a) Liquids: liquid effluent monitor - b) Airborne effluents: ERP Monitor - Reactor Building Vent Monitor - Turbine Building Vent Monitor - Augmented Radwaste Building Vent Monitor	NOTIFICATION OF UNUSUAL EVENT
	1.2 High radiation levels or high airborne contamination which indicates a severe degradation in the control of radioactive materials (sudden increase by a factor of 1000 over normal radiation readings).	1.2.1 Corresponding levels and alarms on: a) Area Radiation Monitoring System. b) Bldg. Ventilation Monitors. c) Continuous Air Monitors. d) Effluent Monitors.	ALERT
	1.3 Radiological effluents exceed 10 times technical specification instantaneous limits, which, if continued over two hours, would result in about 1mR at the site boundary under annual average meteorological conditions.	1.3.1 Determined by Reactor, Turbine, Radwaste, AOG Buildings, and elevated Release Point Radiation Monitor readings and Control Room calibration curves to determine release rates.	ALERT
	1.4 Effluent monitors detect levels corresponding to greater than 50 mrem/hour whole for 1/2 hour or greater than 500 mrem/hour whole body for two minutes (or, five times these levels to the thyroid) at the site boundary for adverse Meteorology. These dose rates are projected based on station releases or are measured in the environs. EPA PAGs are projected to be implemented outside the site boundary.	1.4.1 Determined by Reactor, Turbine, Radwaste, AOG building, and Elevated Release Point radiation monitor readings and Control Room calibration curves to determine release rates.	SITE AREA EMERGENCY

1. (Continued)	1.5 Effluent monitors detect levels corresponding to 1 rem/hour Whole Body (or 5 rem/hour thyroid) at the site boundary under actual meteorological conditions. These dose rates are projected based on other parameters (e.g., radiation levels in containment with leak rate appropriate for existing containment pressure with some confirmation from effluent monitors) or are measured in the environs.	1.5.1 Determined by Reactor, Turbine, Radwaste, AOG building and Elevated Release Point radiation monitor readings and Control Room calibration curves to determine release rates. Dose rate projections per procedure EPIP 5.7.17 or measured dose rates by field monitoring teams.	GENERAL EMERGENCY
2. Indications leading to or actual loss of a fission product barrier.	2.1 Fuel damage indications.	2.1.1 High offgas at steam jet air ejector monitors in excess of 5 x 10(5) uCi/sec. or an increase of 10(5) uCi/sec within a 30-minute period. Determined by observing PNL 9-10 Monitors RMP-RM-150A & B, PNL 9-2 Recorder and annunciators on PNL 9-4 and through use of calibration curves posted in Control Room.	NOTIFICATION OF UNUSUAL EVENT
		2.1.2 Coolant sample activity exceeds 3.1 uCi/gm dose equivalent I-131.	
	2.2 Abnormal coolant parameters exceeding technical specification limits. a) coolant temp. b) coolant pressure c) fuel temperature	2.2.1 a) Determined by core thermal analysis b) Reactor vessel dome pressure shall not exceed 1337 psig at any time when irradiated fuel is present in the vessel or 75 psig any time when operating the RHR pumps in the shutdown cooling mode. Indicated on Panel 9-5 RFC-P1-90A, B, C, or RFC-LR/PR-97 or 98.	NOTIFICATION OF UNUSUAL EVENT

2. (Continued)	2.3 Severe loss of fuel cladding	2.3.1 High offgas at steam jet air ejector monitors, greater than 5 Ci/sec. RMP-RM-150A & B on Control Room panel 9-2.	ALERT
		2.3.2 Primary coolant sample indicates activity levels exceeding 310 uCi/gm, not including iodine spiking.	
	2.4 Loss of coolant flow which has led to fuel failure.	2.4.1 Observation of core flow instrumentation on Control Room panel 9-4 or 9-5.	ALERT
		2.4.2 High offgas at steam jet air ejector monitors in excess of 5 x 10 (5) uCi/sec. or an increase of 10(5) uCi/sec. within a 30-minute period. Determined by observing panel 9-10 SJAE monitors RMP-RM-150A & B, panel 9-2 recorders and annunciators on panel 9-4, and through use of calibration curves posted in Control Room.	
		2.4.3 Coolant sample activity exceeds equilibrium value of 3.1 uCi/gm dose equivalent 1-131.	
	2.5 Degraded core with possible loss of coolable geometry.	2.5.1 Evidenced by low flow and Hi core D/P - indication on Control Room panel 9-5.	SITE AREA EMERGENCY
		2.5.2 Inability to insert in-core detectors.	
	2.6 Loss of two of three fission product barriers with a potential loss of third barrier (e.g., loss of coolant boundary, cladding failure, and a high potential for breach of containment).	2.6.1 Any two with potential for third: a) fuel cladding. 1) High offgas at steam jet air ejector monitors in excess of 5 Ci/sec. Determined by observing panel 9-10 monitors RMP-RM-150A & B. 2) Coolant sample activity exceeds 3.1 uCi/gm of dose equivalent 1-131 per LCO 3.6.B.	GENERAL

2. (Continued)	2.6 (Continued)	2.6.1 b) Primary Coolant Boundary 1) High drywell pressure 2) Low vessel level 3) ECCS initiation 4) Reactor scram 5) Containment activity, sump level humidity and temperature increasing. c) Containment Integrity 1) Inability to isolate primary containment. 2) Suppression pool water volume cannot be maintained between 87,650 cubic feet and 91,000 cubic feet or temperature cannot be maintained below 90°F or 95°F for periods not to exceed 45 days wherever river water temperature is such that 90°F cannot be maintained. Temperature and volume displayed on CR-VBD-J. 3) Unable to maintain drywell to suppression chamber DP. 4) Loss of containment structural integrity. 5) Containment pressure exceeding design.	
3. Steam line break or safety or relief valve failure.	3.1 Failure of a safety or relief valve in a safety-related system to close following a reduction of applicable pressure.	3.1.1 Failure of Blue Indicating Lights (Panel 9-3) to illuminate after safety relief valve(s) closes and Suppression Chamber temp. continues to increase as noted on Control Room Panel 9-21 Recorder, ADS-TR-166.	NOTIFICATION OF UNUSUAL EVENT
	3.2 Main steam line break in primary containment with MSIV or other valve malfunction causing leakage to secondary containment.	3.2.1 Indication may include: a) High drywell pressure b) Low Vessel level c) ECCS Initiation d) Reactor Scram e) High Reactor Building Activity (ARMs, CAMs, or Ventilation monitors)	ALERT

3. (Continued)	3.2 (Continued)	3.2.1	f) Containment sump level, humidity, and temp. increases g) Failure to isolate containment. 1) Observe containment isolation mimic on Control Room panel 9-3.	
	3.3 Main steam line break outside containment without isolation.	3.3.1	Indications may include: a) Low vessel level b) ECCS Initiation c) Reactor Scram d) Failure of MSIV's to isolate as evidenced by mimic display on Control Room panel 9-3. e) High Reactor/Turbine Bldg. activity levels (ARMs, CAMs, or Building Ventilation). f) High Temperature alarms on area temperature monitoring system. g) Steam line high flow indication.	SITE AREA EMERGENCY
	3.4 Small or large break LOCAs, accompanied by failure of ECCS to perform, leading to severe core degradation or melt in from minutes to hours. Breach of containment likely.	3.4.1	Indications are: a) High Drywell pressure b) Low vessel level c) Lack of ECCS Initiation d) Containment activity, sump level humidity, and temperature increase. e) Reactor Scram f) Area temperature monitor increases g) High offgas at steam jet air ejector monitors, greater than 5 Ci/sec. h) Primary coolant sample indicates activity levels exceeding 310 uCi/gm. i) Containment unisolable j) Suppression pool water volume cannot be maintained between 87,650 cubic feet and 91,000 cubic feet or temp. cannot be maintained below 90°F or 95°F for periods not to exceed 45 days whenever river water temperature is such that 90°F cannot be maintained. Temperature and volume displayed on CR-VBD-J. k) Containment pressure exceeding design.	GENERAL EMERGENCY

3. (Continued)	3.5 Small or large break LOCA occurs and containment performance is unsuccessful, affecting longer term success of the ECCS. Could lead to core degradation or melt in several hours without benefit of containment boundary.	3.5.1 Indications are: a) High Drywell pressure b) Low vessel level c) Lack of EEC Initiation d) Containment activity, sump level, humididy, and temperature increase. e) Reactor Scram. f) Area temperature monitor increases. g) High offgas at steam jet air ejector monitors greater than 5 Ci/gm. h) Primary coolant sample indicates activity levels exceeding 310 uCi/gm. i) Containment unisolable j) Suppression pool water volume cannot be maintained between 87,650 cubic feet and 91,000 cubic feet or temp. cannot be maintained below 90°F or 95°F for periods not to exceed 45 days whenever river water temperature is such that 90°F cannot be maintained. Temperature and volume displayed on CR-VBD-J. k) Containment pressure exceeding design.	GENERAL EMERGENCY
4. Primary Leak	4.1 Primary leak rate Technical Specification exceeded.	4.1.1 Limit of 5 gpm unidentified flow, 25 gpm identified flow with no capability to isolate and shut down required. Indicated by Drywell Floor & Equipment Sump Integrator located on Control Room panel 9-19 and annunciated on 9-4.	NOTIFICATION OF UNUSUAL EVENT
	4.2 Primary leak rate Technical Specification exceeded.	4.2.1 Unidentified leak greater than 50 gpm as indicated by Drywell Floor & Equipment Sump Integrators located on Control Room panel 9-19 and annunciated on 9-4.	ALERT

4. (Continued)	4.3 Known loss of coolant accident greater than make-up capacity.	4.3.1 Observation of ECCS Initiation and Control Room or local rack indication of failure to maintain vessel level above -145.5 inches.		SITE AREA
	4.4 Small or large break LOCAs, accompanied by failure of ECCS to perform, leading to severe core degradation or melt in from minutes to hours. Breach of containment likely.	4.4.1 Indications are: a) High Drywell pressure b) Low vessel level c) Lack of ECCS Initiation d) Containment activity, sump level humidity, and temperature increase. e) Reactor Scram f) Area temperature monitor increases g) High offgas at steam jet air ejector monitors, greater than 5 Ci/sec. h) Primary coolant sample indicates activity levels exceeding 310 uCi/gm. i) Containment unisolable j) Suppression pool water volume cannot be maintained between 87,650 cubic feet and 91,000 cubic feet or temp. cannot be maintained below 90°F or 95°F for periods not to exceed 45 days whenever river water temperature is such that 90°F cannot be maintained. Temperature displayed on CR-VBD-J; level displayed on Panels 9-3 and 9-4. k) Containment pressure exceeding design.		GENERAL EMERGENCY
	4.5 Small or large break LOCA occurs and containment performance is unsuccessful, affecting longer term success of the ECCS. Could lead to core degradation or melt in several hours without benefit of containment boundary.	4.5.1 Indications are: a) High Drywell pressure b) Low vessel level c) Lack of EEC Initiation d) Containment activity, sump level, humididy, and temperature increase. e) Reactor Scram. f) Area temperature monitor increases. g) High offgas at steam jet air ejector monitors greater than 5 Ci/gm. h) Primary coolant sample indicates activity levels exceeding 310 uCi/gm I-131.		GENERAL EMERGENCY

4. (Continued)	4.5 (Continued)	4.5.1	i) Containment unisolable j) Suppression pool water volume cannot be maintained between 87,650 cubic feet and 91,000 cubic feet or temp. cannot be maintained below 90°F or 95°F for periods not to exceed 45 days whenever river water temperature is such that 90°F cannot be maintained. Temperature and volume displayed on CR-VBD-J. k) Containment pressure exceeding design.	GENERAL EMERGENCY
5. Loss of power or alarms.	5.1 Loss of all offsite power or loss of all onsite AC power capability.	5.1.1	Indications: a) Loss of normal Control Room lighting. b) Start-up transformer under voltage. c) Emergency transformer under voltage. d) Associated alarms on Control Room VBD-A, VBD-B, VBD-C, Generator trip, or Scram. e) Both Diesels inoperative, may annunciate on Control Room VBD-C.	NOTIFICATION OF UNUSUAL EVENT
	5.2 Loss of offsite power and loss of all onsite AC power for a period of less than 15 minutes.	5.2.1	Indications: a) Loss of station ac lighting b) Generator trip c) Reactor Scram d) Failure of start-up station transformer e) Both diesels inoperative f) Subsequent failure of all ac powered equipment.	ALERT
	5.3 Loss of all onsite DC power for less than 15 minutes.	5.3.1	Indications: a) Rx Scram b) Loss of Control Room indicating lights on 4160 and 480 equipment c) Loss of Annunciators d) Loss of control power.	ALERT

5. (Continued)	5.4	Most or all alarms (annunciators) non-functional and reactor is not shut down.	5.4.1 Control Room observation	ALERT
	5.5	Loss of offsite power and loss of onsite ac power for more than 15 minutes.	5.5.1 Evidenced by: a) Loss of station ac lighting b) Generator trip c) Reactor scram d) Failure of station start-up transformer e) Failure of station service transformer f) Failure of both diesel generators to start g) Subsequent failure of all ac powered equipment h) Inability to recover within 15 minutes.	SITE AREA EMERGENCY
	5.6	Loss of all vital onsite dc power for more than 15 minutes.	5.6.1 Indications: a) Reactor scram b) Loss of voltage and amperage indication on Control Room panel VBD-C c) Loss of Control Room indicating lights on 4160 and 480 equipment d) Loss of annunciators e) Loss of equipment control power f) Inability to recover within 15 minutes.	SITE AREA EMERGENCY
	5.7	Most or all alarms (annunciators) lost and station transient initiated or in progress.	5.7.1 As observed by Control Room operators	SITE AREA EMERGENCY
	5.8	Failure of offsite and onsite power with loss of emergency cooling capabilities for an extended period.	5.8.1 As observed by Control Room Operators.	GENERAL EMERGENCY

6. Other limiting condition for operation.	6.1 Any Technical Specification LCO resulting in immediate shutdown. Indications or alarms on process or effluent parameter not functional in Control Room to an extent requiring station shutdown or other significant loss of assessment or communications capability.	6.1.1 As detailed in Technical Specification LCOs.	NOTIFICATION OF UNUSUAL EVENT
		6.1.2 All meteorological instrumentation inoperative.	
		6.1.3 Inability to compute Core Thermal Limits.	
	6.2 Loss of primary containment integrity to the extent requiring shutdown by Technical Specifications.	6.2.1 Suppression pool water volume cannot be maintained between 87,650 cubic feet and 91,000 cubic feet, or temperature cannot be maintained below 90°F or 95°F for periods not to exceed 45 days whenever river water temperature is such that 90°F cannot be maintained. Temperature and volume displayed on CR-VBD-J.	NOTIFICATION OF UNUSUAL EVENT
		6.2.2 Unable to maintain drywell to suppression chamber DP. Instrument Indication on CR-VBD-J.	
		6.2.3 Loss of containment structural integrity.	
	6.3 Loss of engineered safety feature to the extent requiring shutdown by Technical Specifications.	6.3.1 LCOs for engineered safety features exceeded.	NOTIFICATION OF UNUSUAL EVENT
		6.3.2 LCOs for Fire Protection System exceeded.	
	6.4 Emergency Core Cooling System (ECCS) initiated and discharged to vessel.	6.4.1 Manual or automatic activation involving a valid indication of a safety problem with an emergency core cooling parameter not being maintained.	NOTIFICATION OF UNUSUAL EVENT
	6.5 Any serious radiological exposure of plant personnel or the transportation to offsite facilities of contaminated injured personnel.	6.5.1 As situations occur.	NOTIFICATION OF UNUSUAL EVENT

6. (Continued)	6.6 Complete loss of any function needed for plant cold shutdown.	6.6.1 Inability to condense steam (loss of condenser, circ. water)	ALERT
		6.6.2 Loss of RCIC.	
		6.6.3 Unable to place RHR in shutdown cooling mode.	
	6.7 Complete loss of any function needed for plant hot shutdown.	6.7.1 Inability to control recirculating water pumps or control rods. Loss of heat sink (i.e., RHR Steam Condensing Water).	SITE AREA
7. Reactor Protection System Failure.	7.1 Failure of the reactor protection system to initiate and complete a scram, which brings the reactor subcritical.	7.1.1 Indication of Reactor Scram panel 9-5 without corresponding: a) Valid scram signal and computer printout indicates not all rods scrammed. b) Computer printout indicates not all rods full in and c) Nuclear instruments do not register expected decreases in power level.	ALERT
	7.2 Transient requiring operation of shutdown systems with failure to scram (continued power generation with no core damage immediately evident).	7.2.1 Any Control Room panel 9-5 "RED" annunciator indicating a full scram signal without full in rod indication on 9-5 full core display.	SITE AREA EMERGENCY
		7.2.2 No decrease in reactor power level.	
		7.2.3 No increase observed on steam jet air ejector monitors, RMP-RM-150A & B. Coolant sample activity does not exceed equilibrium value of 3.1 uCi/gm.	
	7.3 Transient plus failure of requisite core shutdown system (e.g., Scram). Could result in core meltdown after several hours with subsequent containment failure likely.	7.3.1 Any control room panel 9-5 "RED" annunciator, without scram indication on 9-5 full core display or no decrease in reactor power level. a) Subsequent increase to greater than 5 Ci/sec. activity at steam jet air ejectors b) Primary coolant activity exceeds 510 uCi/gm I-131.	GENERAL EMERGENCY

8. Fuel Handling Accident	8.1 Fuel handling accident on refueling floor.	8.1.1 Refueling floor Area Radiation Monitor alarms on Control Room panel 9-3.	ALERT
		8.1.2 Refueling Floor Continuous Air Monitors in alarm.	
		8.1.3 Reactor Building Ventilation Monitors in alarm.	
		8.1.4 Initiation of standby gas treatment system.	
		8.1.5 Verbal reports from personnel on refueling floor.	
	8.2 Major damage to spent fuel on refueling floor.	8.2.1 Verbal reports or Annunciation of: a) Refueling floor area radiation monitor. b) Refueling floor continuous air monitor. c) Reactor building ventilation exhaust monitor. d) Low spent fuel pool water level (Control Room panel 9-4).	SITE AREA EMERGENCY
		8.2.2 Initiation of: a) Reactor building isolation standby gas treatment.	
9. Control Room Evacuation	9.1 Evacuation of Control Room required or anticipated with control of shutdown systems established from local stations.	9.1.1 As deemed necessary by Emergency Director or Shift Supervisor.	ALERT
	9.2 Evacuation of Control Room accompanied by the inability to locally control shutdown systems within 15 minutes.	9.2.1 Control Room evacuation accompanied by lack of access to local shutdown system controls.	SITE AREA EMERGENCY

9. (Continued)	9.3 Any major internal or external events (e.g., fires, earthquakes, substantially beyond design basis) which could cause massive common damage to plant systems.	9.3.1 Situation Evident	GENERAL EMERGENCY
10. Fire	10.1 Fire at the plant exceeding short-term capabilities of immediate onsite fire fighting teams.	10.1.1 As determined by the Shift Fire Brigade Leader.	NOTIFICATION OF UNUSUAL EVENT
	10.2 Serious fire with potential to cause degradation of plant safety systems.	10.2.1 Fire Protection System Alarm and visual confirmation: a) ECCS Compartments b) Cable Spreading Room c) Diesel Generator Room d) Verbal reports.	ALERT
	10.3 Fire compromising the function of safety systems.	10.3.1 Inability to initiate a safety system due to fire when a safety system is needed to maintain the station in a safe condition. Equipment failure or inaccessibility.	SITE AREA EMERGENCY
11. Security Threat.	11.1 Security threat, or attempted entry, or attempted sabotage.	11.1.1 As observed or reported by: a) Security Force b) CAS c) SAS	NOTIFICATION OF UNUSUAL EVENT
	11.2 Ongoing security compromise.	11.2.1 As observed or reported by: a) Security Force b) CAS c) SAS	ALERT
	11.3 Imminent loss of physical control of the station.	11.3.1 As observed or reported by: a) Security Force b) CAS c) SAS	SITE AREA EMERGENCY
	11.4 Loss of physical control of the facility.	11.4.1 As observed or reported by: a) Security Force b) CAS c) SAS d) Other station personnel.	GENERAL EMERGENCY

12. Natural Phenomena	12.1 Natural phenomenon being experienced or projected beyond usual levels. a) any earthquake b) 50-year flood c) tornado on site	12.1.1 Ground motion greater than .01g as indicated by Control Room Seismic Monitoring Panel.	NOTIFICATION OF UNUSUAL EVENT
		12.1.2 River level greater than 897 feet.	
		12.1.3 As reported or observed.	
	12.2 Severe natural phenomenon being experienced or projected, such as: a) Earthquake exceeding Operating Basis Earthquake levels; b) Tornado striking facility; or c) Winds near design level d) Flood	12.2.1 Ground acceleration detected in excess of 0.10g horizontal on Control Room Seismic Alarm.	ALERT
		12.2.2 As reported or observed.	
		12.2.3 Winds approaching 100 mph horizontal velocity detected.	
		12.2.4 Water above 903 ft level.	
	12.3 Severe natural phenomenon being experienced or projected with plant not in cold shutdown, such as: a) Earthquake causing facility damage and core or safety system damage. b) Sustained winds or tornado causing significant damage to vital facilities/structures. c) Flood waters affecting equipment needed for shutdown.	12.3.1 Ground in excess of 0.1g horizontal on Control Room Seismic Alarm and if there is safety system damaged.	SITE AREA EMERGENCY
		12.3.2 Anemometers detect sustained winds in excess of 100 mph.	
		12.3.3 Damage to plant safety equipment.	
	12.4 Any major internal or external events (e.g., fires, earthquakes, substantially beyond design basis) which could cause massive common damage to plant systems.	12.4.1 Situation evident.	GENERAL EMERGENCY

13. Other Hazards	13.1 Other hazards experienced or projected: a) aircraft crash onsite; b) onsite explosion; c) onsite or nearsite related accidents that could result in the release of toxic material or spills of flammable materials. d) train derailment onsite that may affect plant safety; e) Turbine component failure causing rapid plant S/D.	13.1.1 As visually observed by, or reported to, CNS personnel.	NOTIFICATION OF UNUSUAL EVENT
	13.2 Other plant conditions exist that warrant increased awareness on the part of state/local offsite authorities.	13.2.1 As situations occur	NOTIFICATION OF UNUSUAL EVENT
	13.3 Other hazards being experienced or projected, such as: a) aircraft crash on facility; b) missile impact on facility; c) explosion damage affecting plant operation; d) entry into facility environs of uncontrolled toxic or flammable gas; or e) turbine failure causing casing penetration and resultant radiological effluent releases exceeding 10 times Technical Specifications instantaneous limits. (Some effect on facility experienced or anticipated.)	13.3.1 As reported by, or to, station personnel.	ALERT
	13.4 Other plant conditions exist warranting precautionary activation of the TSC and other key emergency personnel as well as EOF placed on a standby status.	13.4.1 As deemed necessary by Emergency Director or Shift Supervsor	ALERT

13. (Continued)	13.5 Other hazards being experienced or projected with reactor not in cold shutdown, such as: a) aircraft crash affecting vital structures by impact or fire; b) severe damage to Safe Shutdown equipment from missiles or explosion; c) entry of uncontrolled flammable gas into vital areas; entry of uncontrolled toxic gases into vital areas where lack of access to the area constitutes a safety problem.	13.5.1 As observed by, or reported to, station personnel.	SITE AREA
	13.6 Any other plant condition exists from whatever source, that makes release of large amounts of radioactivity in a short time period possible, e.g., shutdown occurs, but requisite decay heat removal systems (RHR) or nonsafety systems heat removal means are rendered unavailable. Core melt could occur in about ten hours with subsequent containment breach likely.	13.6.1 a) All rods scrammed b) S/D Margin is achieved c) Inability to condense steam (i.e., loss of condenser, circ. water) d) Loss of RCIC e) Unable to place RHR in shutdown cooling mode. f) High offgas at steam jet air ejectors greater than 5 Ci/sec. g) Primary coolant sample indicates activity levels greater than 310 uCi/gm I-131.	GENERAL EMERGENCY

I. PURPOSE

A. To outline the actions required of station personnel, visitors, and contractors when an ALERT condition is declared.

B. This procedure directs personnel to the use of some additional procedures to adequately respond to those conditions classified as an ALERT.

II. DISCUSSION

A. An ALERT condition is defined as any condition that involves an actual or potential substantial degradation of the safety level of the station. At this classification level, small releases of radioactivity may occur. Although the releases might exceed CNS Technical Specifications, EPA Protective Action Guidelines are not expected to be implemented. Station Operator modification of station operating status is a probable corrective action if such modification has not already been accomplished by automatic protection systems.

B. The decision to make an immediate initial declaration rests with the Emergency Director, who, in turn, directs the Operation Communicator to perform the necessary notifications. Offsite notification assures that emergency personnel are readily available to respond if the situation becomes more serious.

C. The following CNS emergency response facilities will be activated: the TSC, and OSC. In addition the EOF and key emergency personnel may be placed on standby status.

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev. 1

IV. PREREQUISITES

An ALERT has been declared in accordance with the provisions of procedure EPIP 5.7.1, "Emergency Classification."

V. LIMITATIONS

None

VI. PRECAUTIONS

None

VII. EQUIPMENT

None

VIII. PROCEDURE

A. Immediate Actions

1. The Shift Supervisor assumes the function of the Emergency Director.

2. The Shift Supervisor implements EPIP 5.7.6, "Notification."

3. The Station Superintendent relieves the Shift Supervisor as the Emergency Director as soon as possible.

4. The Shift Supervisor directs the Control Operator to activate the alarm for ten seconds and make the following announcement.

a. "ALERT, ALERT

There is (what) in/at (where).

Emergency personnel report to assigned stations. All other personnel, contractors, and visitors report to the CNS Security Building. All personnel stay clear of the affected area."

b. Repeat the alarm and announcement.

c. Sound the emergency alarm for two minutes.

B. Subsequent Actions

1. The Emergency Director performs the following:

a. Implement EPIP 5.7.7, "Activation of the TSC."

b. Place the EOF on standby and implement EPIP 5.7.9, "Activation of the EOF." (optional)

c. Determine the need for any additional personnel. Direct the Operations Communicator to call in additional personnel as needed by contacting the appropriate department supervisors, which are given in the Emergency Telephone Directory.

d. Implement additional EPIPs as required. Complete the checklist as indicated in Attachment A, "ALERT Implementing Procedure Checklist."

e. Reevaluate the emergency classification as conditions change by using EPIP 5.7.1, and provide corresponding information to the onsite Emergency Response Facilities and appropriate governmental agencies.

f. Close out or recommend reduction in emergency classification by verbal summary to offsite authorities followed by a written summary within eight hours of closeout or classification reduction.

2. OSC Activation

a. The Maintenance & OSC Coordinator and Chemistry and Health Physics Coordinator will implement EPIP 5.7.8, "Activation of the OSCs."

IX. ATTACHMENTS

Attachment A, "Alert Implementing Procedure Checklist."

	Procedure Name	Required Yes/No	Completed Date/Time
EPIP 5.7.1	Emergency Classification	X	___/___
EPIP 5.7.6	Notification	X	___/___
EPIP 5.7.7	Activation of TSC	X	___/___
EPIP 5.7.8	Activation of OSC's	X	___/___
EPIP 5.7.9	Activation of EOF		___/___
EPIP 5.7.10	Personnel Assembly and Accountability	X	___/___
EPIP 5.7.12	Emergency Radiation Exposure Control		___/___
EPIP 5.7.13	Personnel Monitoring and Decontamination		___/___
EPIP 5.7.15	Rescue and Reentry		___/___
EPIP 5.7.16	Release Rate Determination		___/___
EPIP 5.7.17	Dose Assessment		___/___
EPIP 5.7.18	Offsite and Site Boundary Monitoring		___/___
EPIP 5.7.19	Onsite Radiological Monitoring		___/___
EPIP 5.7.20	Protective Action Guides		___/___
EPIP 5.7.23	Media		___/___
EPIP 5.7.24	Medical		___/___

REMARKS:

I. PURPOSE

This procedure provides notification instructions to be followed upon declaration of an emergency condition. These include initial notification, follow-up information, and closeout announcements.

II. DISCUSSION

A. Upon declaration of an emergency condition, all notifications and communications will be handled from the Control Room (CR) until the Technical Support Center (TSC) and/or the Emergency Operations Facility (EOF) are activated. All telephone numbers needed for notification or follow-up information transmission are in the "Emergency Telephone Directory" located in the CR, TSC, EOF, Station Superintendent's Office, and other designated areas.

B. During any notification activity, if the primary communications link fails to contact the desired party, consider other methods such as the National Warning System (NAWAS), radio courier, or relay through another party.

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev. 1

IV. PREREQUISITES

A. A NOTIFICATION OF UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY, or a GENERAL EMERGENCY has been declared in accordance with EPIP 5.7.1, "Emergency Classification".

B. EPIP 5.7.2, 5.7.3, 5.7.4, or 5.7.5 has been implemented

V. LIMITATIONS

A. State and local initial notifications must be completed within 15 minutes of the classification and declaration of the emergency.

B. NRC initial notification must be made within one hour.

VI. PRECAUTIONS

Accuracy in understanding a notification message is extremely important. For messages transmitted to offsite agencies, ensure that the message is delivered concisely and that the recipient repeats the message as a check on his understanding.

VII. EQUIPMENT

None

VIII. PROCEDURE

A. Immediate Actions

1. Initial Notification

a. Shift Supervisor

1) Direct a Control Room Operator to complete Attachment A and give it to the Operations Communicator.

2) Direct the Operations Communicator to call the Station Superintendent and inform him of the emergency event and station status.

3) Contact the Nebraska State Patrol (NSP) Dispatcher in accordance with Attachment B.

4) Direct the Operations Communicator to contact the individuals and organizations listed on the Emergency Notification Call Check List (Attachment C), and provide them with the information contained in Attachment A.

5) For an ALERT or higher classification, or as conditions warrant, direct the Operations Communicator to contact the personnel on the Station Internal Call List (Attachment D), and inform them of the situation.

6) The Operations Communicator may be directed to make other calls. For all notifications other than initial notifications detailed above, use the "Emergency Notification Record", Attachment F.

b. Prompt notification of the public and activation of the EBS.

1) In the event that the Emergency Director deems it necessary to immediately notify the public, and governmental authorities are not in a position to do so, he will:

a) Advise the county sheriff(s) to activate the prompt notification sirens.

b) Activate the EBS and transmit the appropriate preformatted message contained in Attachment G.

Note: Activation of the EBS in Nebraska or Missouri requires the use of specific codes. These codes are maintained in the Control Room.

B. Follow-up Information

1. Concurrent with notification of individuals and organizations on the Emergency Notification Call Check List (Attachment C), the Emergency Director, or his designee, will complete the Followup Information Form (Attachment E) and will give it to the Operation's Communicator (on the line with the NRC). This information will also be transmitted to those federal, state or local agencies or other organizations, as necessary, through the Technical Support Center (TSC) or the Emergency Operations Facility (EOF), when activated.

C. Subsequent Actions

1. If an emergency is reclassified to a higher or lower level, or is is closed out, the Emergency Director will so notify offsite individuals and organizations listed on the Emergency Notificaton Call Check List. The calls will be recorded on the Emergency Notification Record, Attachment F.

2. When the Technical Support Center (TSC) becomes fully functional, the communications responsibility shifts from the Control Room to the TSC. All records and data related to previous notifications will then be transferred to the TSC.

IX. ATTACHMENTS

Attachment A, "Nuclear Power Plant Incident Initial Report to Offsite Government Agencies"

Attachment B, "Emergency Notification for Nebraska State Patrol"

Attachment C, "Emergency Notification Call Check List"

Attachment D, "Station Internal Call List"

Attachment E, "Emergency Notification Record"

Attachment F, "Nuclear Power Plant Incident Followup Information Form Update Report #____ to Offsite Government Agencies"

Attachment G, "Preformatted EBS Messages"

NUCLEAR POWER PLANT INCIDENT
INITIAL REPORT TO OFFSITE GOVERNMENT AGENCIES

1. This is _____ (name), _____ (title) at the Cooper Nuclear Station. Telephone call-back number is _____. Time is _____.

2. NOTIFICATION OF UNUSUAL EVENT/ ALERT/ SITE AREA EMERGENCY/ GENERAL EMERGENCY was declared at _____ (time) on _____ (date).

3. Airborne/ Liquid/No release of radioactive material occurred.

4. The estimated duration of the release is _____ minutes.

   The release is Terminated/ In progress/ Potential.

5. Wind speed is _____ MPH; wind direction is from _____°.

6. Sector(s) affected are _____ for _____ miles.
   _____ for _____ miles.

7. Recommended protective actions are:

   Advisory - for information only - no public notificaton (NOTIFICATION OF UNUSUAL EVENT).

   Standby - be prepared for possible public action (ALERT).

   Public Response - notify public (SITE AREA & GENERAL EMERGENCY).

   15-minute siren notification - standby for more information (EBS).

   Limit use of potentially affected water (liquid release).

   In-house shelter may be necessary (SITE AREA EMERGENCY).

   In-house shelter (GENERAL EMERGENCY - 2 mile radius/5 miles downwind).

   Evacuation may be necessary (SITE AREA & GENERAL EMERGENCY).

8. Remarks: _____
   _____
   _____
   _____

9. This report was received by:

   _____ (name), _____ (agency) _____ (time), _____ (date)

EMERGENCY NOTIFICATION FOR NEBRASKA STATE PATROL

1. Method.

   a. Primary: Hotline to NSP/Nebraska EOC, no verification required.

   b. Alternate: telephone (long distance 477-3951), verification required.

   c. Alternate: NAWAS, no verification required.

2. Verification.

   Caller will identify himself and then ask name of NSP Dispatcher. Once this is established caller will respond with badge number of NSP Dispatcher by using information provided by NSP letter. If further authentication is felt to be necessary the caller will also give the initials of NSP Dispatcher. This will complete the verification and the message will be transmitted. If this is not successful then another Dispatcher on shift should attempt to accomplish the verification with the caller.

3. Types of Emergency Notification.

   In the event one or more of the following emergency conditions are reported, NSP Dispatcher will take the action indicated:

   a. NOTIFICATION OF UNUSUAL EVENT - contact State Civil Defense Duty Officer.

   b. ALERT - use Nebraska State Patrol Nuclear Power Plant Emergency Notification List.

   c. SITE AREA EMERGENCY - (same as ALERT).

   d. GENERAL EMERGENCY - (same as ALERT).

   e. EMERGENCY TEST EXERCISE - (same as ALERT).

4. Sample Messages.

   a. Hotline - This is Cooper Nuclear Station. We have a (an) (emergency condition, see Step 3. above). Request you initiate emergency agency notifications.

   b. Telephone - This is _____ (Name) representing the Nebraska Public Power District. I am calling to notify you of an (emergency condition, see Step 3. above) at Cooper Nuclear Station. Request you initiate emergency agency notifications. (Caller may provide additional information.)

   c. NAWAS - This is Cooper Nuclear Station. We have a (an) (emergency condition, see Step 3. above). Request you initiate emergency agency notifications.

EMERGENCY NOTIFICATION CALL CHECKLIST

Instructions:

1. Contact each individual or organization using the Emergency Telephone Directory. If the primary party cannot be contacted, call the alternate number listed.

2. If a party cannot be contacted, bypass that party and proceed to the next one on the list. After all other notifications have been completed, attempt to contact the bypassed parties. If a party still cannot be contacted, inform the Emergency Director, recommending other methods be used (National Warning System (NAWAS), radio, courier, or relay through another party).

3. When the party answers, identify yourself and inform the party to write down the information to be provided.

4. Read the notification, identifying each blank and then specifying the information entered in that blank.

5. After the notification has been completed, ask the individual to read back the information and, if necessary, correct any errors.

6. Record the name of the individual contacted and the time of contact on the Emergency Notification Call Check List.

7. Proceed to the next party on the call list and continue in this manner until all individuals and organizations listed on the Emergency Notification Call Check List have been notified.

EMERGENCY NOTIFICATION CALL CHECKLIST

	TELEPHONE NO.*	NAME OF PERSON CONTACTED	INITIAL MESSAGE RECEIVED TIME/INITIAL
A. For All Emergencies			
1. Nebraska Civil Defense Headquarters	_____	_____	_____/_____
2. Missouri Disaster Planning and Operations Office	_____	_____	_____/_____
3. NRC Resident Inspector	_____	_____	_____/_____
4. NRC (within 1 hour via ENS)	_____	_____	_____/_____
5. NPPD Division Manager, Power Operations**	_____	_____	_____/_____
B. For ALERT, SITE AREA EMERGENCY, and GENERAL EMERGENCY			
1. Kansas Division of Emergency Preparedness	_____	_____	_____/_____
2. Iowa Office of Disaster Services	_____	_____	_____/_____
C. As Directed by the Emergency Director			
1. Nemaha County Sheriff	_____	_____	_____/_____
2. Atchison County Sheriff	_____	_____	_____/_____
3. Richardson County Sheriff	_____	_____	_____/_____
4. Auburn Police Department	_____	_____	_____/_____
5. NPPD Lead Dispatcher	_____	_____	_____/_____

*Telephone numbers are contained in the CNS Emergency Telephone Directory. Also, numbers are contained in auto-dialer listing.

**May be contacted by the Station Superintendent

STATION INTERNAL CALL LIST

Instructions:

1. Contact each individual using the Emergency Telephone Directory. If the primary party cannot be contacted, call the alternate number listed.

2. If a party cannot be contacted, bypass that party and proceed to the next one on the list. After all other notifications have been completed, attempt to contact the bypassed parties. If a party still cannot be contacted, inform the Emergency Director.

3. When the party answers, identify the emergency classification and provide further instructions as conditions warrant.

4. Record the name of the individual contacted and the time of contact on the Station Internal Call List.

STATION INTERNAL CALL LIST

CONTACTED TIME/INITIAL	INDIVIDUAL (EMERGENCY BILLET)*	INDIVIDUAL (NORMAL BILLET)	NAME OF PERSON CONTACTED
____/____	1. Maintenance & OSC Coordinator	Maint. Super.	_____
____/____	2. Engineering Coordinator	Engineering Super.	_____
____/____	3. Chem. & H.P. Coordinator	Chem. & H.P. Super.	_____
____/____	4. Control Room Director	Operations Super.	_____
____/____	5. Security/ Administrative/ Logistics Coordinator	Admin. Super.	_____
____/____	6. Alt. Emergency Director	Assist. to Station	_____

Engineering Coordinator will call:

1. Reactor Engineer
2. Mechanical Engineer
3. Electrical Engineer
4. I&C Engineer
5. Technical Data Technician

Maintenance & OSC Coordinator will call:

1. Electrical Foreman
2. Mechanical Supervisor
3. I&C Supervisor

Maintenance Foreman And Supervisors will call:

1. Maintenance personnel as required

Chem. and H. P. Coordinator will call:

1. Chemist
2. Health Physicist

Chemist will call Chem Techs as required

Health Physicist will call H. P. Techs as required

Security/Administration/Logistics Coordinator will call Administrative Assistants and Security Personnel as required.

*Emergency Billets (and alternates) are identified in the Emergency Telephone Directory under the ALERT classification.

NUCLEAR POWER PLANT INCIDENT FOLLOWUP INFORMATION
FORM UPDATE REPORT #____ TO OFFSITE GOVERNMENT AGENCIES

1. This is _____ (name), _____ (title) at the Cooper Nuclear Station. Telephone call-back number is _____.

   Time is _____.

2. ALERT/ SITE AREA/ GENERAL EMERGENCY was declared at _____ (time)

   on _____ (date)

3. Airborne/ Liquid/ No release of radioactive material occurred.

   Note: N/A to Any of the Following Entries Indicates the Section is Not Applicable or Not Available

4. Estimated duration of this release is _____ minutes.

5. Current release rates are _____Ci/sec. of noble gas, _____ Ci/sec. of iodine and _____Ci/sec. of particulates.

6. Estimated quantity is _____Ci of noble gas, _____Ci of iodine, _____Ci or particulate, and _____Ci of liquid released from _____ (point of release), height: _____ft. Chemical and physical forms of this material are _____
   _____.

7. Wind speed is _____MPH, wind direction from _____°; atmospheric stability category _____; precipitation _____.

8. Site boundary exposures are:

   Actual/projected dose rate: whole body ____Rem/hr, thyroid ___ Rem/hr.

   Actual/projected integrated dose: whole body ___Rem, thyroid ___Rem.

9. Projected peak dose rates are estimated as follows:

   At 2 miles (sectors _____) whole body _____Rem/hr, thyroid _____Rem/hr.

   At 5 miles (sectors _____) whole body _____Rem/hr, thyroid _____Rem/hr.

   At 10 miles (sectors _____) whole body _____Rem/hr, thyroid _____Rem/hr.

10. Projected integrated dose is:

At 2 miles (sectors _____) whole body _____ Rem, thyroid _____ Rem

At 5 miles (sectors _____) whole body _____ Rem, thyroid _____ Rem

At 10 miles (sectors _____) whole body _____ Rem, thyroid _____ Rem

11. Surface contaiminatin is Estimated/ Measured as:

In Plant, _____; Onsite _____; Offsite _____ microcuries/$100cm^2$

12. The following emergency response actions are underway:

Environmental Sampling Radiation Monitoring Surveys

Other: _____

_____

13. The following protective measures should be considered for persons living in sectors _____ as delineated in the State of Nebraska/Iowa Emergency Response Plans for Nuclear Power Plant Incidents:

Shelter (In-house) for _____ miles .

Evacuation - pregnant women & pre-school children for _____ miles

Evacuation - general public for _____ miles

14. We Have Requested/ Are Requesting the following offsite assistance:

Fire, Rescue, Police Other (specify) _____

_____

15. Our prognosis of the emergency based on plant information is:

Conditions are stable.
The plant status is improved.
The emergency condition may be relaxed or teminated within _____ hours.
Progress is not favorable.

16. This report was received by:

_____, _____ _____ _____
(name) (agency) (time) (date)

EMERGENCY NOTIFICATION RECORD

EMERGENCY CLASSIFICATION _____ DATE _____ SHEET _____

PERSON CALLED	AFFILIATION	TIME	REACHED	BY	MESSAGE GIVEN	RESPONSE

EBS MESSAGES

(In House Shelter)

(Note: Delete nonapplicable information.)

"The Nebraska Public Power District has declared a General Emergency at Cooper Nuclear Station. This announcement is to warn you that a hazardous level of radioactivity has been released (is about to be released) and is expected to reach:

(identify affected areas) _____

_____

_____

The Nebraska Public Power District recommends that people in (identify areas) take shelter. Go inside. Close all windows, vents, and doors, and turn off any heating or air conditioning systems.

I repeat, all persons now in (identify areas) are requested to take shelter. Turn off any heating or air conditioning systems. Close all windows and vents. Pets and livestock should also be sheltered if possible.

Stay tuned to this (or EBS) station for more information."

EBS MESSAGES

(Evacuation)

(Note: Strike out inapplicable words.)

"The Nebraska Public Power District has declared a General Emergency at the Cooper Nuclear Station. This announcement is to warn you that a hazardous level of radioactivity has been released (is about to be released).

The Nebraska Public Power District recommends persons within _____ miles of the plant in _____

_____

as delineated in the Cooper Nuclear Station Emergency Planning Information Booklet should evacuate immediately.

I repeat, if you are now in any of the following area(s) _____ _____

_____ (repeat prceeding evacuation information) _____

_____

_____

_____

Please leave as soon as possible.

Use your own vehicle or ride with a neighbor. DO NOT stay in your home unless you have previously registered as requiring special assistance from your county sheriff. You should take essential items with you. Refer to your public information booklet for additional details.

(Repeat every three minutes for 30 minutes.)

I. PURPOSE

A. This procedure describes the sequence of events and the manning requirements for activation of the Technical Support Center in the event of an ALERT, SITE AREA EMERGENCY, or GENERAL EMERGENCY declaration. Areas covered are:

1. Functions of the TSC and its interface with other bodies of the Onsite Emergency Organization.

2. Activation criteria, including a roster of personnel and checklists of required actions to be performed.

II. DISCUSSION

A. Functions of the TSC

The TSC provides facilities, communications, and technical data for support of the Emergency Director/TSC Director. TSC staff personnel shall research drawings, specifications, test data, and other engineering data as required to:

1. Recommend alternative courses of action which may be taken to mitigate the consequences of the event.

2. Evaluate the effects of abnormal system configuration on future operational evolutions.

3. Ensure that technical evaluations are being conducted with the most current information and that operational evolutions are properly planned.

The TSC also provides:

1. A communications link for data flow between the Control Room and the Emergency Operations Facility (EOF).

2. Offsite dose assessment and communications capabilities until the EOF is prepared to assume these responsibilities.

Attachment A shows the floor plan of the TSC.

B. Staffing of the TSC

1. The TSC is staffed with the following personnel:

a. Emergency Director (for an ALERT or until the EOF is activated)

b. TSC Director (if the EOF has been activated)

c. Maintenance & OSC Coordinator

d. Security/Administration/Logistics Coordinator

e. Chemistry and Health Physics Coordinator

f. Engineering Coordinator

g. Reactor and Computer Engineer

h. Mechanical Engineer

i. Electrical Engineer

j. I/C Engineer

k. Technical Data Technician

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev. 1

IV. PREREQUISITES

An ALERT or higher level emergency has been declared in accordance with EPIP 5.7.1, "Emergency Classification", and actions specified in EPIP 5.7.3 and/or 5.7.4 or 5.7.5 are being implemented.

V. LIMITATIONS

The TSC facilities may be used by designated operating personnel for normal daily operations as well as for training and emergency drills. Use of the TSC during normal operation shall be limited to activities that will not degrade TSC preparedness to react to abnormal conditions or reduce TSC systems reliability.

If the TSC becomes uninhabitable, the TSC plant management function shall be transferred to the Control Room.

VI. PRECAUTIONS

If the Area Alarm Monitor and/or the Continuous Air Monitor alarms, an area habitability survey should be conducted. If the Chemistry and Health Physics Coordinator determines that the TSC is uninhabitable, the TSC function shall be transferred to the Control Room. Personnel not considered crucial in responding to the specific emergency situation will report to the Maintenance OSC, I&C/Electrical OSC, Chemistry and Health Physcis OSC or the Security Building Auditorium.

VII. EQUIPMENT

A. Communications

1. A list of communications equipment located in the TSC and instructions for its use are detailed in EPIP 5.7.22, "Communications".

B. Emergency Equipment

1. A list of emergency equipment located in the TSC and instructions for maintaining the readiness of the equipment are detailed in EPIP-5.7.21, "Emergency Equipment Inventory".

VIII. PROCEDURE

A. TSC personnel shall report to the TSC and proceed with check off lists as follows:

1. Emergency Director - Attachment B (and C for ALERT only)

2. TSC Director - Attachment C (SITE AREA and GENERAL EMERGENCIES)

3. Security/Administration/Logistics Coordinator - Attachment D

4. Maintenance & OSC Coordinator - Attachment E

5. Chemistry and Health Physics Coordinator - Attachment F

6. Engineering Coordinator - Attachment G

B. The Emergency Director will initiate the following action items:

1. Conduct meetings with the Emergency Director (relieved), C&HP Coordinator, TSC Director, and Engineering Coordinator and any other members of the TSC staff as appropriate. Ensure that TSC personnel are prepared to assume their responsibilities.

2. Declare the TSC operational and have the following transfers of control made:

a. Emergency Director, notify the Shift Supervisor that you are taking over the function of overall responsibility for site response.

b. C&HP Coordinator, notify the Control Room that you are assuming the assessment function.

c. Ensure that other personnel take command by notifying the appropriate contacts.

IX. ATTACHMENTS

Attachment A, "TSC Floorplan"

Attachment B, "Emergency Director Check List"

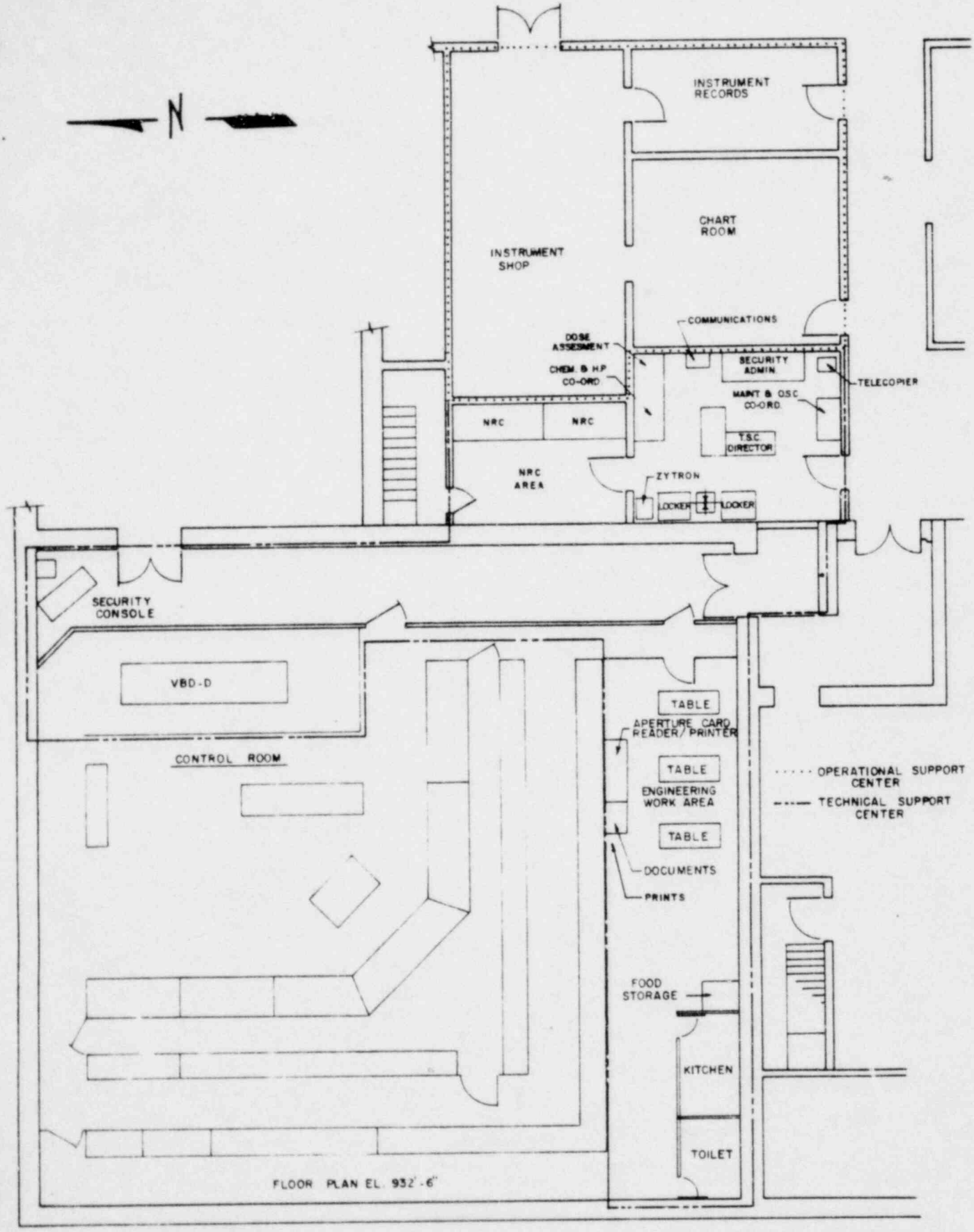
Attachment C, "TSC Director Checklist"

Attachment D, "Security/Administration/Logistics Coordinator Checklist"

Attachment E, "Maintenance & OSC Coordinator Checklist"

Attachment F, "Chemistry and Health Physics Coordinator Checklist"

Attachment G, "Engineering Coordinator Checklist"


N
INSTRUMENT RECORDS
CHART ROOM
INSTRUMENT SHOP
COMMUNICATIONS
DOSE ASSESSMENT
CHEM. & H.P. CO-ORD.
SECURITY ADMIN
TELECOPIER
MAINT. & O.S.C. CO-ORD.
NRC
NRC
T.S.C. DIRECTOR
NRC AREA
ZYTRON
LOCKER
LOCKER
SECURITY CONSOLE
VBD-D
TABLE
APERTURE CARD READER/ PRINTER
CONTROL ROOM
TABLE
ENGINEERING WORK AREA
TABLE
DOCUMENTS
PRINTS
OPERATIONAL SUPPORT CENTER
TECHNICAL SUPPORT CENTER
FOOD STORAGE
KITCHEN
TOILET
FLOOR PLAN EL. 932'-6"

EMERGENCY DIRECTOR CHECKLIST

ACTION ITEMS — TIME/INITIALS

1. Contact the Shift Supervisor and review:

   A. The logic used to establish the classification of the event. _____/_____

   B. Status of plant conditions. _____/_____

   C. Status of notification to offsite agencies. _____/_____

   D. Recommended protective actions made to date and his knowledge of states' actions (if necessary). _____/_____

2. Upon reporting to the TSC, assume from the Shift Supervisor the responsibilities for site response and communication with offsite agencies, and ensure that the following positions are manned: _____/_____

Emergency Director	Station Superintendent	Assistant to Station Superintendent
Engineering Coordinator	Engineering Supervisor	Station Reactor Engineer
Maintenance and OSC Coordinator	Maintenance Supervisor	Maint. Planner and Scheduler
Chem. & HP Coordinator	Chem. & HP Supervisor	Station HP
Security/Admin./Logistics Coordinator	Administrative Supervisor	Tech. Assistant to Station Supervisor

3. Notify the NPPD Division Manager of Power Operations of the declared EAL _____/_____

4. Ensure that the Chem. & H.P. Coordinator has contacted Nebraska Department of Health, Division of Radiological Health and the Missouri Division of Health and determined the status of implementation of previously recommended protective actions. _____/_____

5. Verify that notification has been made to the emergency response organization. _____/_____

6. Declare the TSC to be operational. _____/_____

7. Assign personnel to evaluate plant conditions based on information available from Control Room. _____/_____

EMERGENCY DIRECTOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
8. Review the personnel accountability report.	_____/_____
9. Determine the need to evacuate nonessential personnel to offsite location. (Required for SITE AREA and/or GENERAL EMERGENCY.)	_____/_____
10. Review the results of dose projections.	_____/_____
11. Make protective action recommendations as appropriate, considering existing plant conditions and potential degradation.	_____/_____
12. Authorize dispatch of onsite survey teams as necessary.	_____/_____
13. Authorize dispatch of offsite survey teams as necessary.	_____/_____
14. Authorize dispatch of rescue/reentry teams as necessary.	_____/_____
15. Authorize emergency exposure limits as necessary.	_____/_____
16. Determine long-term equipment and man-power needs.	_____/_____
17. After plant is restored to a safe condition, ensure emergency plan is deactivated and offsite personnel and agencies are notified.	_____/_____
18. Provide verbal summary to the NPPD Division Manager of Power Operations and NRC when emergency conditions are resolved and followup with a written summary within eight hours. (Within 24 hours for a NOTIFICATION OF UNUSUAL EVENT).	_____/_____

TSC DIRECTOR CHECKLIST

ACTION ITEMS			TIME/INITIALS
1.	Establish and maintain continuous communications with the Control Room.		_____/_____
2.	Determine plant status and relay this information to the TSC staff.		_____/_____
3.	Check to assure that all emergency equipment in the TSC is in a state of readiness.		_____/_____
4.	Have Reactor Engineer report to the Control Room Director and support CR activities as required.		_____/_____
5.	The minimum TSC staff shall consist of:	NAME	
	a) TSC Director	_____	_____/_____
	b) Chemistry & Health Physics Coordinator	_____	_____/_____
	c) Engineering Coordinator	_____	_____/_____
	d) Maintenance & OSC Coordinator	_____	_____/_____
	e) Mechanical Engineer	_____	_____/_____
	f) Electrical Engineer	_____	_____/_____
	g) I/C Engineer	_____	_____/_____
	h) Reactor Engineer	_____	_____/_____

SECURITY/ADMINISTRATIVE/LOGISTICS COORDINATOR CHECKLIST

ACTION ITEMS — TIME/INITIALS

1. Ensure all communications devices operate in the TSC _____/_____

Telephones	_____	Base Radio (Security)	_____
Gaitronics	_____	Base Radio (Offsite)	_____
Bone Phone	_____	TSC Intercom	_____
Sound Powered Phone	_____		

2. Activate Continuous Air Monitor. _____/_____

3. Ensure copy machine is placed in TSC. _____/_____

4. Notify the Emergency Director/TSC Director when the communications equipment is functional or of any problems and proposed solutions. _____/_____

5. Check station security by contacting the Central Alarm Station Operator. Request that they initiate POS accountability - receive printout for TSC at SAS. _____/_____

6. Ensure the security force is aware of the current status of the emergency and of possible actions that might be required of it. Contact Guard Shift Supervisor. _____/_____

7. Ensure CAS, SAS, and Access Control are manned (unless emergency is security-related. _____/_____

8. Inform the Central Alarm Station Operator that you are ready to assist in security requests/actions. _____/_____

9. Have Guard Shift Supervisor call in off-duty security personnel as necessary. _____/_____

10. Ensure the Emergency Response Facility Rosters are available for personnel accountability. _____/_____

11. Take personnel accountability reports from supervisory personnel located in the following Emergency Response Coordination Centers:

	Extension	Time	Initials
Control Room	253/271		
HP OSC	272/258		
Mech. OSC	220/248		
I&C Elec. OSC	213/283		
EOF	224		
TSC	261		

    Compare names with security POS and roster lists to aid in accountability. Report results of accountability to the Emergency Director. _____/_____

12. Check with TSC personnel and determine what documents or support is needed. _____/_____

MAINTENANCE & OSC COORDINATOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Check that the Maintenance and E&IC OSC staffs are present and ready to assume responsibility. Receive similar report from the C&HP Coordinator regarding the C&HP OSC staff. Report this or any problems to the Security/Admin./Logistics Coord.	_____/_____
2. Assess maintenance problems affecting the emergency and report the problems and any proposed solutions to the ED.	_____/_____
3. Perform a personal accountability of all TSC personnel.	_____/_____
4. Receive accountability reports/status from OSC's and report information to the Security/Admin./Logistics Coordinator.	_____/_____
5. Review with Emergency Director need for EOF activation ALERT only, if SITE AREA or GENERAL EMERGENCY dispatch personnel to move EOF trailer into its proper position.	_____/_____
6. Ensure that TSC Status Board is updated as conditions change.	_____/_____

CHEMISTRY AND HEALTH PHYSICS (C&HP) COORDINATOR AND SUPPORT CHECK LIST

ACTION ITEMS	TIME/INITIALS
1. Upon arrival, check that the following items are available to perform dose assessments calculations:	
a. Computerized dose assessment equipment	_____/_____
b. Meteorological overlays	_____/_____
c. Procedures and forms	_____/_____
2. Receive, update, and post status on the Rad Status Board.	_____/_____
3. Contact the Control Room and determine:	
Extent and consequences of radiological releases and plant conditions.	_____/_____
Protective Action Recommendations made to date.	_____/_____
Location of onsite and offsite monitoring teams (if dispatched).	_____/_____
4. Determine that the C&HP OSC staff is present and ready to perform the initial tasks of:	
a. Radiological Assessment	_____/_____
b. Onsite and offsite surveys	_____/_____
Report status of C&HP OSC staff to Maintenance and OSC Coordinator.	_____/_____
5. Notify the Emergency Director that the Radiological Assessment Staff is ready to perform dose assessment and determine protective action recommendations.	_____/_____
6. Receive personnel accountability status from HP OSC and report to Security/Admin./Logistics Coordinator.	_____/_____
7. Ensure that the Continuous Air Monitor has been activated.	_____/_____
8. Contact the Nebraska Department of Health, and the Missouri Division of Health and determine the status of implementation of previously recommended protective actions.	_____/_____

ENGINEERING COORDINATOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Ensure necessary TSC equipment, plant flow rams, records, drawings, and schematics are available.	_____/_____
2. Ensure that the aperture cards are moved from the Engineering Area to the TSC.	_____/_____
3. Ensure staff is ready to assume engineering support duties.	_____/_____
4. Determine the need for engineering and/or design specialist assistance (G.E.; Burns & Roe; Stone & Webster, etc.) and recommend to the E.D. that such assistance be obtained.	_____/_____

I. PURPOSE

A. This procedure describes the activation and subsequent operation of the three Operations Support Centers (OSCs) in the event of an ALERT, SITE AREA EMERGENCY, or GENERAL EMERGENCY.

B. The topics addressed are:

1. Functions of the OSCs and their interface with other onsite emergency response facilities.

2. Activation criteria, including a roster of personnel and check lists of required actions to be performed.

II. DISCUSSION

A. Functions of the OSCs

1. Health Physics OSC

a. The Health Physics (HP) OSC is the staging area for all Chemistry and HP personnel who may be required to provide chemistry and radiation protection assistance.

b. This OSC also serves as a center where the initial accountability check of all on-duty Chem/HP personnel is performed.

c. Emergency monitoring teams are organized from this point and other radiological or chemical assignments are made here at the direction of the Chem/HP Coordinator.

d. The Health Physics OSC is located on the 918-foot elevation of the Office Building in the HP office area.

2. Maintenance OSC

a. The Maintenance OSC serves as a staging area for all Mechanical Maintenance personnel (whose services may be required during the emergency) and from which these personnel are dispatched.

b. This OSC also serves as the assembly area for the initial accountability check of all on-duty mechanical maintenance personnel.

c. The Maintenance OSC is located on the 903-foot elevation of the Machine Shop.

3. I&C/Electrical OSC

   a. This OSC serves as the staging area for all Electricians and I&C Technicians (whose services may be required during the emergency) and from which these personnel are dispatched.

   b. The instrument shop is the center where initial accountability of all on-duty Electricians and I&C Technicians personnel is performed.

   c. The I&C/Electrical OSC is located on the 932'-6" elevation of the Turbine Building in the Instrument Shop.

B. Staffing of the OSCs

1. The HP OSC is staffed with the following:

   a. HP OSC Supervisor (Health Physicist - ALERT only)

   b. HP Technicians as required

   c. Chemist (OSC Supervisor - SITE AREA AND GENERAL EMERGENCY only)

   d. Chemistry Technicians as required

2. The Maintenance OSC is staffed with the following:

   a. Maintenance OSC Supervisor (Mechanical Supervisor)

   b. Mechanical personnel as required

3. The I&C/Electrical OSC is staffed with the following:

   a. I&C/Electrical OSC Supervisor (I&C Supervisor)

   b. Electrical Foreman

   c. Electricians as required

   d. I&C Technicians as required

4. If activation of the OSCs is required during other than normal working hours, additional personnel are summoned through call lists and directed to assemble in these facilities for assignments. Telephone numbers for emergency response personnel are contained in the Emergency Telephone Directory.

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev 1

IV. PREREQUISITES

An ALERT or higher level emergency has been declared in accordance with EPIP 5.7.1, "Emergency Classification," and actions specified in EPIP 5.7.3 are being implemented.

V. LIMITATIONS

Since no habitability criteria are established for the OSCs, evacuation of OSC personnel may be required as dictated by radiological emergency conditions.

VI. PRECAUTIONS

If the Area Alarm Monitor and/or the Continuous Air Monitor alarms, an area habitability survey should be conducted. The results of this survey should be transmitted to the Chemistry & Health Physics Coordinator who will determine the need to evacuate OSC personnel to the Security Building Auditorium.

VII. EQUIPMENT

A. Communications

1. A list of communications equipment located in the OSCs and instructions for its use are detailed in EPIP 5.7.22, "Communications".

B. Emergency Equipment

1. A list of emergency equipment located in the OSCs and instructions for maintaining the readiness of the equipment are detailed in EPIP 5.7.21, "Emergency Equipment Inventory".

VIII. PROCEDURE

A. OSC personnel shall report to respective centers and proceed with checkoff lists as follows:

1. HP OSC

a. HP OSC Supervisor - Attachment A

1) For a SITE AREA EMERGENCY or GENERAL EMERGENCY the Chemist will perform this checkoff.

2. Maintenance OSC

a. Maintenance OSC Supervisor - Attachment B

3. I&C/Electrical OSC

a. I&C/Electrical OSC Supervisor - Attachment C

B. The appropriate OSC Coordinator shall report the status of the OSCs to the Emergency Director.

IX. ATTACHMENTS

Attachment A, "HP OSC Supervisor Checklist"

Attachment B, "Maintenance OSC Supervisor Checklist"

Attachment C, "I&C/Electrical OSC Supervisor Checklist"

ATTACHMENT A

HP OSC SUPERVISOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Complete the personnel accountability group checklist and report results to the Chem/HP Coordinator in the TSC.	_____/_____
2. Ensure that all Chemistry and HP equipment is in a state of readiness.	_____/_____
3. Check emergency kit located in the HP OSC and ensure equipment is complete. (Inventory List)	_____/_____
4. Check roster list for survey teams, and locate survey maps for survey teams.	_____/_____
5. Check personnel decontamination facilities and equipment.	_____/_____
6. Check on any chemistry and radiochemistry problems.	_____/_____
7. Check to ensure HP OSC support is available to perform survey or other assessment functions and notify Chem/HP OSC Coordinator in TSC when complete.	_____/_____
8. Activate the Continuous Air Monitor.	_____/_____

ATTACHMENT B

MAINTENANCE OSC SUPERVISOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Ensure all communication devices operate in the Maintenance OSC. - Telephone(s) _____ - Gaitronics _____ - Bonephone _____	_____/_____
Inform the Maintenance & OSC Coordinator in the TSC of any problems.	_____/_____
2. Dispatch all visitors, contractors, and nonessential personnel to the EOF (Security Building) Auditorium.	_____/_____
3. Complete the personnel accountability group checklist and report results to the Maintenance & OSC Coordinator in the TSC.	_____/_____
Note: Request permission from the Maintenance & OSC Coordinator to retrieve personnel in work areas.	
4. Perform habitability survey of the Maintenance OSC and inform the Chemistry and Health Physics Coordinator in the TSC of the results.	_____/_____
5. Ensure that all emergency equipment and personnel are in a state of readiness.	_____/_____
I. Maintenance Emergency Response Equipment.	
- Ensure Emergency Equipment Inventory is available per EPIP 5.7.15, Attachment B.	_____/_____
- Check equipment operability (battery checks)	_____/_____
II. Health Physics Emergency Response Equipment.	
- Ensure Emergency Equipment Inventory is available per EPIP 5.7.15, Attachment A.	_____/_____
- Check equipment operability. - Battery Checks _____ - Zero Dosimeters _____ - SCBA's Full _____	
6. Report OSC readiness to the Maintenance & OSC Coordinator in the TSC.	_____/_____
7. Maintain an OSC supervisors log.	_____/_____

ATTACHMENT C

I&C/ELECTRICAL OSC SUPERVISOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Ensure all communication devices operate in the I&C/ Electrical OSC.	_____/_____
- Telephone(s) _____ - Gaitronics(s) _____ - Bonephone _____	
Inform the Maintenance & OSC Coordinator in the TSC of any problems.	_____/_____
2. Dispatch all visitors, contractors, and nonessential personnel to the EOF (Security Building) Auditorium.	_____/_____
3. Complete the personnel accountability group checklist and report results to the Maintenance & OSC Coordinator.	_____/_____
4. Perform habitability survey of the I&C/Electrical OSC and inform the Chemistry and Health Physics Coordinator in the TSC of the results.	_____/_____
5. Ensure that all emergency equipment and personnel are in a state of readiness.	_____/_____
I. I&C/Electrical Emergency Response Equipment.	
- Ensure Emergency Equipment Inventory is available per EPIP 5.7.15, Attachment C.	_____/_____
- Check equipment operability (battery checks)	_____/_____
II. Health Physics Emergency Response Equipment Inventory.	
- Ensure Emergency Equipment Inventory is available per EPIP 5.7.15, Attachment A.	_____/_____
- Check equipment operability.	
- Battery Checks _____ - Zero Dosimeters _____ - SCBA's Full _____	
6. Report OSC readiness to the Maintenance & OSC Coordinator.	_____/_____
7. Maintain an OSC supervisors log.	_____/_____

I. PURPOSE

A. This procedure describes the sequence of events and requirements for activation of the Emergency Operations Facility (EOF) in the event of a SITE AREA EMERGENCY, or GENERAL EMERGENCY. This procedure also defines the approach to be used in placing the EOF on standby in the ALERT condition.

B. The topics addressed are:

1. Functions of the EOF and its interface with both onsite and offsite Emergency Organizations.

2. Activation criteria, including a roster of personnel and check lists of required actions to be performed.

II. DISCUSSION

A. Functions of the EOF

1. Provide overall management of NPPD emergency response and resources.

2. Provide coordination of offsite radiological assessment and recommendations for the protection of the public.

3. Provide coordination of emergency response activities with local, state, and federal organizations.

4. Provide operational and communications liaison with offsite radiological emergency survey teams.

5. Disseminate emergency status updates, via the media release center (MRC), to the news media.

B. The EOF is located in the Security Building outside the station security area. Attachment A shows the floor plan of the EOF.

1. If emergency conditions dictate relocation from the EOF, emergency evaluation and coordination activities will be accomplished from the alternate EOF (AEOF). The AEOF is located in the town of Auburn, Nebraska, housed in the Auburn National Guard Armory. Attachment B shows the floor plan of the AEOF.

C. Staffing of the EOF

1. The EOF is staffed with the following key personnel:

a. Emergency Director

b. Operations Advisor

c. Public Information Manager

d. Security/Administration/Logistics Manager

e. Communications Manager

f. Contract Support Manager

g. Radiological Manager

h. Radiological Assessment Coordinator

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev. 1

IV. PREREQUISITES

An ALERT, SITE AREA EMERGENCY or a GENERAL EMERGENCY has been declared in accordance with EPIP 5.7.1 and actions specified in EPIP 5.7.3 and/or EPIP 5.7.4 and 5.7.5 are being implemented.

V. LIMITATIONS

The EOF facility may be used by designated CNS personnel for normal daily operations as well as for training and exercises. Use of the EOF during normal operations shall be limited to activities that will not degrade EOF activation, operations, or reliability.

VI. PRECAUTIONS

A. After the EOF is activated, security protection shall be upgraded to restrict access to those personnel assigned to this facility.

B. If the Area Alarm Monitor and/or the Continuous Air Monitor alarms, an area habitability survey should be conducted. The results of the survey should be transmitted to the Radiological Manager who will determine the need to evacuate EOF personnel to the Alternate EOF.

VII. EQUIPMENT

A. Communications

1. A list of communications equipment located in the EOF is contained in the CNS Emergency Plan. Instructions for its use are detailed in EPIP 5.7.22, "Communications".

B. Emergency Equipment

1. A list of emergency equipment located in the EOF and the AEOF is detailed in EPIP 5.7.2i, "Emergency Equipment Inventory". The AEOF contains a larger quantity of decontamination equipment should decontamination of evacuated station personnel be required.

VIII. PROCEDURE

A. In the event the emergency escalates from an Alert to a higher classification, the Emergency Director (in the TSC):

1. Directs the Engineering Supervisor to assume the duties of TSC Director.

2. Relocates to the EOF.

B. EOF Personnel shall report to the EOF and proceed with check off lists as follows:

1. Emergency Director - Attachment C

2. Public Information Manager - Attachment D

3. Security/Administration/Logistics Manager - Attachment E

4. Communications Manager - Attachment F

5. Radiological Manager - Attachment G

C. The Emergency Director shall:

1. Conduct meetings with the Radiological Manager, Operations Advisor, Communications Manager, Security/Administration/ Logistics Manager, and any other appropriate members of the EOF staff. Ensure they have assumed their responsibilities.

2. Declare the EOF operational and notify the Shift Supervisor and TSC Director that the EOF has assumed the function of overall responsibility for the emergency.

IX. ATTACHMENTS

Attachment A, "EOF Floor Plan"

Attachment B, "AEOF Floor Plan"

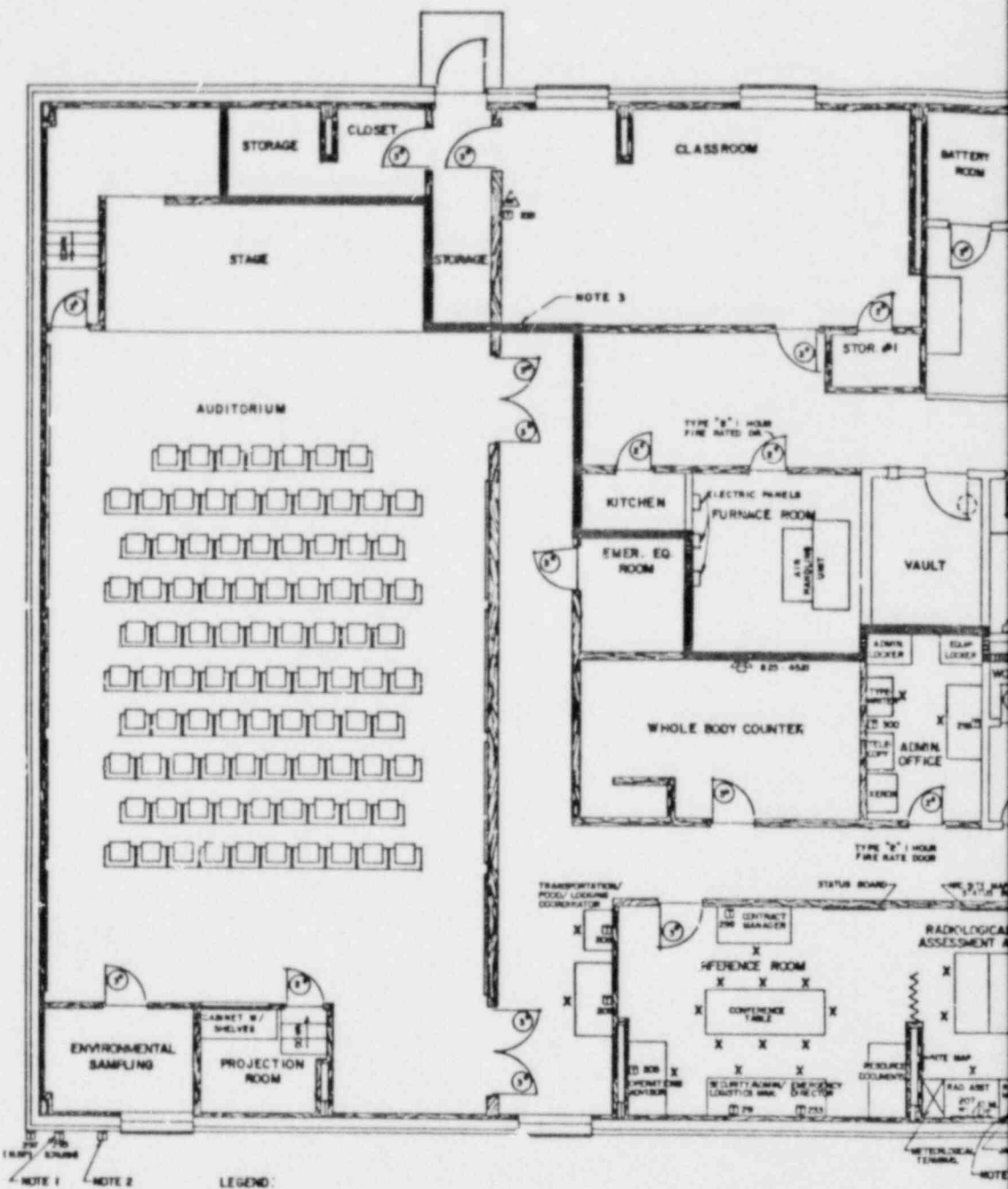
Attachment C, "Emergency Director Check List"

Attachment D, "Public Information Manager Check List"

Attachment E, "Security/Administration/Logistics Manager Checklist"

Attachment F, "Communications Manager Checklist"

Attachment G, "Radiological Manager Checklist"

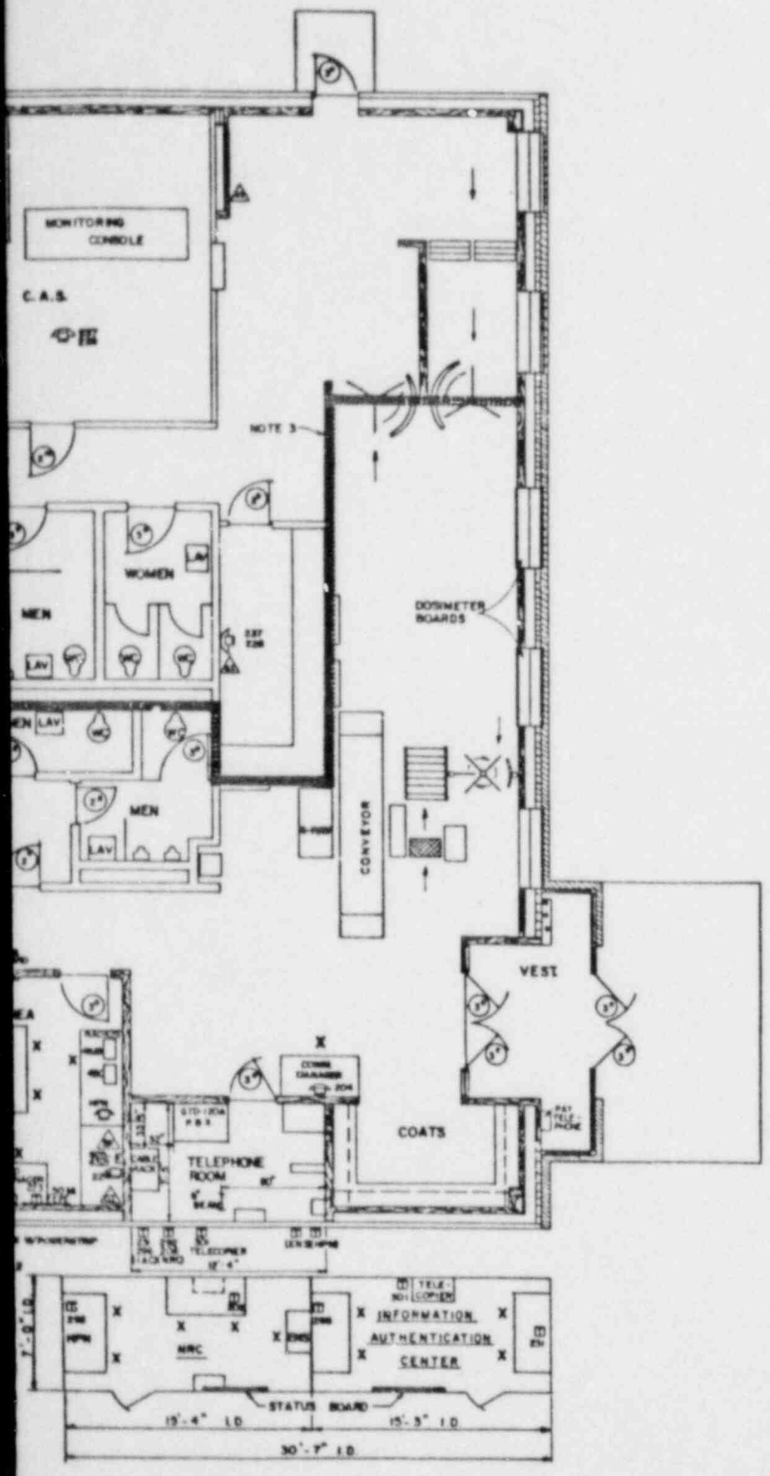


LEGEND:

- TELEPHONE SET W/PUSHBUTTON DIALING
- TELEPHONE SET /DEDICATED LINE OR SPECIAL USE
- SPEAKER PHONE
- RADIO CONTROL HEAD FREQ. GIVEN IN MHz
- INTERCOM G.T. = GAI-TRONICS B.F. = ITT 5416 / BONE FONE
- TELEPHONE JACKS
- MULTI-LINE TELEPHONE SET

FLOOR PLAN

SCALE : 3/16" = 1'-0"



TRAILER FLOOR PLAN

SCALE: 3/16"=1'-0"

N

NOTES:

1. AVAILABLE AT THIS POINT ARE 2/115 VAC AND ONE/ 220 VAC OUTLETS.
2. INTERCOM SYSTEM TO STATE CIVIL DEFENSE VAN.
3. [illegible] DESIGNATES SECURITY BOUNDARY.

W.O. #60883-200

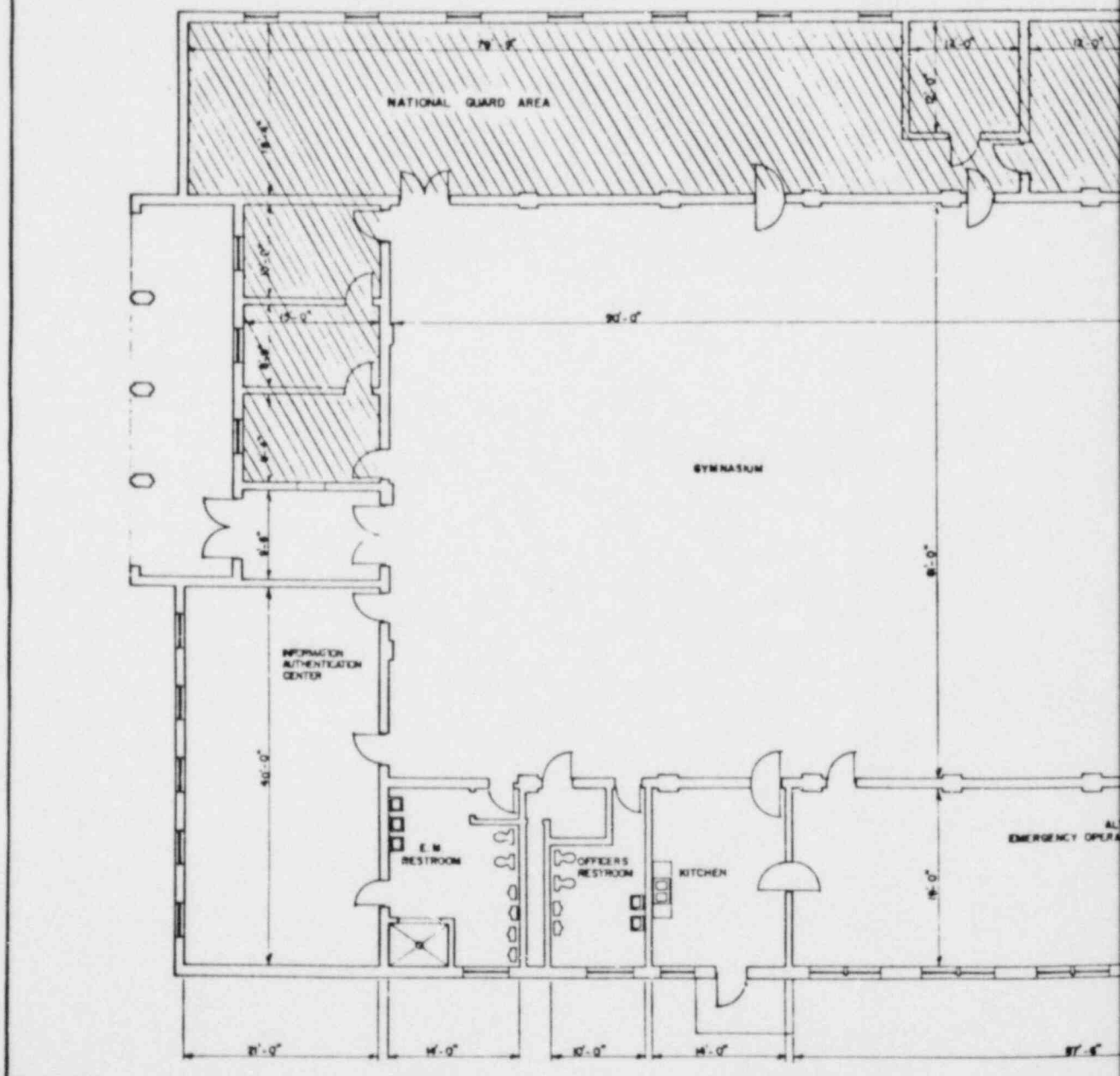
	000:01				6250	

COOPER NUCLEAR STATION
EMERGENCY OPERATIONS FACILITY
EPIP 5.7.9 Attachment A

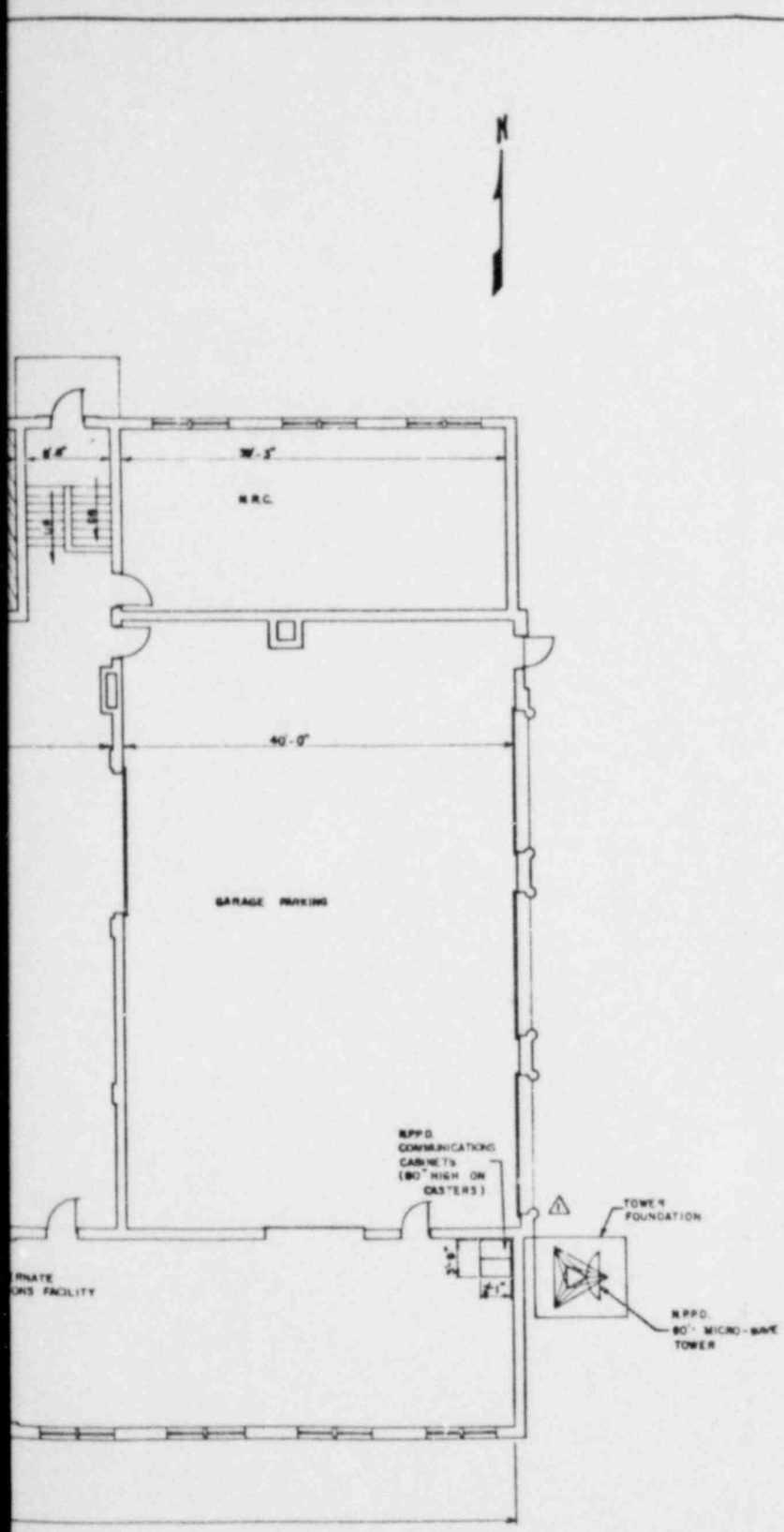
PWH 11/5/81

Nebraska Public Power District

ND 44206 | 0



FIRST FLOOR PLAN
SCALE: 1/8" = 1'-0"



ALTERNATE
EMERGENCY OPERATIONS FACILITY
(NATIONAL GUARD ARMORY AUBURN, NE.)
EPIP 5.7.9 Attachment B

Nebraska Public Power District

453093832 | 0

ATTACHMENT C

EMERGENCY DIRECTOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Contact the Shift Supervisor and review:	
A. The logic used to establish the classification of the event.	_____/_____
B. Status of plant conditions.	_____/_____
C. Status of notification to offsite agencies.	_____/_____
D. Recommended protective actions made to date and his knowledge of states' actions.	_____/_____
2. Upon reporting to the EOF, assume from the Shift Supervisor the responsibilities for site response and communication with offsite agencies.	_____/_____
3. Notify the NPPD Division Manager of Power Operations of the declared EAL, if not already previously completed.	_____/_____
4. Verify that notification has been made to the emergency response organization, and the following key assignments have been manned:	_____/_____

Emergency Director	Station Superintendent	Assistant to Station Superintendent
Operations Advisor	Day Shift Supervisor No. 1	Day Shift Supervisor No. 2
Radiological Manager	Chem. & HP Supervisor	Environmental Manager - G.O.
Radiological Assessment Coordinator	Health Physicist	Environmental Supervisor - G.O.
Security/Admin./Logistics Manager	Administrative Supervisor	Tech. Assistant to Station Superintendent
Contract Support Manager	Nuc. Eng. Dept. Project Eng. - G.O.	Nuclear Eng. Dept. Mech. Engineer - G.O.
Public Information Manager	Public Info. Manager	Public Info. Coordinator
Communication Manager	Communications Engineering Supervisor - York	Communications Supervisor - York

ATTACHMENT C

EMERGENCY DIRECTOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
5. Ensure that the Chem. & H.P. Coordinator has contacted Nebraska Department of Health, Division of Radiological Health and the Missouri Division of Health and determined the status of implementation of previously recommended protective actions.	_____/_____
6. Declare the EOF to be operational.	_____/_____
7. Assign personnel to evaluate plant conditions based on information available from Control Room, and ensure that EOF Status Board is updated as conditions change.	_____/_____
8. Review the personnel accountability report.	_____/_____
9. Determine the need to evacuate nonessential personnel to offsite location. (Required for Site Area and/or General Emergency).	_____/_____
10. Review the results of dose projections.	_____/_____
11. Make protective action recommendations as appropriate, considering existing plant conditions and potential degradation.	_____/_____
12. Authorize dispatch of onsite survey teams as necessary.	_____/_____
13. Authorize dispatch of offsite survey teams as necessary.	_____/_____
14. Authorize dispatch of rescue/reentry teams as necessary.	_____/_____
15. Authorize emergency exposure dose limits as necessary.	_____/_____
16. Determine long-term equipment and man-power needs.	_____/_____
17. After plant is restored to a safe condition, ensure emergency plan is deactivated and offsite personnel and agencies notified.	_____/_____
18. Provide verbal summary to the NPPD Division Manager of Power Operations and offsite authorities when emergency conditions are resolved and followup with a written summary within eight hours. (Within 24 hours for an Unusual Event).	_____/_____

ATTACHMENT D

PUBLIC INFORMATION MANAGER CHECK LIST

ACTION ITEMS	TIME/INITIALS
1. Contact the GOEC and determine status of past press releases.	_____/_____
2. Inquire of Nebraska and Missouri Information Officers regarding any past state press releases.	_____/_____
3. Determine plant status from Emergency Director or Operations Advisor.	_____/_____
4. Determine if adequate staff has arrived at the MRC.	_____/_____
5. Prepare draft news releases for review by the Emergency Director.	_____/_____
6. Transmit approved news releases to MRC.	_____/_____

ATTACHMENT E

SECURITY/ADMINISTRATION/LOGISTICS MANAGER CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Check with EOF and station personnel to determine special needs concerning supplies, manpower, and transportation.	_____/_____
2. Determine if adequate logistics personnel are present to carry out duties.	_____/_____
3. Organize logistics staff and arrange to obtain any needed equipment, clerical services, and typewriters.	_____/_____
4. Ensure that Maintenance Personnel move the EOF trailer to the proper location, and place it in operation (i.e., hook up electrical supply, communications, etc.).	_____/_____
5. Receive additional equipment needed and issue to individuals requiring it.	_____/_____
6. Ensure that Security Shift Supervisor is present.	_____/_____
7. Have Security Shift Supervisor call in off-duty security personnel as necessary for security functions.	_____/_____
8. Have Security Shift Supervisor initiate personnel accountability by computer printout and checkoff of personnel in TSC, OCS's, and EOF. Conduct personnel accountability in the EOF and report all personnel accountability results to Emergency Director.	_____/_____
9. Ensure that adequate food and lodging is available to support the emergency organization, convenient to the emergency area and that transportation will be available to the emergency personnel.	_____/_____
10. Activate the Continuous Air Monitor.	_____/_____

ATTACHMENT F

COMMUNICATIONS MANAGER CHECKLIST*

ACTION ITEMS	TIME/INITIALS
1. Set up the communications equipment in the EOF. (See EPIP 5.7.22)	_____/_____
2. Check out the communications equipment for readiness.	_____/_____
3. Contact the TSC to determine any communications problems that need to be corrected or additional equipment needed.	_____/_____
4. Issue radios (low band) to offsite monitoring teams.	_____/_____

*Interim responsibility will be delegated to an onsite individual until Communications Manager arrives.

ATTACHMENT G

RADIOLOGICAL MANAGER CHECK LIST

ACTION ITEMS	TIME/INITIALS
1. Check that all materials needed to perform assessments are available:	
a. Computerized dose assessment equipment	_____/_____
b. Meteorolgoical overlays	_____/_____
c. Procedures and forms	_____/_____
d. Radio for field team communications	_____/_____
2. Receive update and post status on the Radiological Status Board.	_____/_____
3. Determine that the staff on hand is adequate to perform the initial tasks and consists of at least the following:	
a. Radiological Assessment Staff.	_____/_____
b. Offsite Survey Teams 1 and 2.	_____/_____
4. Contact the C&HP Coordinator in the TSC and determine:	
a. Protective Action Recommendations made to date.	_____/_____
b. Location of onsite and offsite monitoring teams.	_____/_____
5. Contact the C&HP Coordinator in the TSC and inform him that the assessment function is being transferred to the EOF.	_____/_____
6. Notify the Emergency Director that the Radiological Assessment staff is ready to perform dose assessment and determine protective action recommendations.	_____/_____
7. Ensure that the Continuous Air Monitor has been activated.	_____/_____

I. PURPOSE

A. This procedure describes the immediate emergency personnel assembly and accountability actions to be taken by all on-site personnel, security officers, contractors, and visitors in the event of a station emergency.

B. This procedure also provides a means to ascertain the names of missing individuals within 30 minutes and account for all onsite individuals continuously thereafter.

II. DISCUSSION

A. In the event of an emergency situation at CNS, it is imperative that all personnel on-site are notified of the situation, their whereabouts identified for safety and security purposes, and that they respond in a coordinated effort to the emergency.

An emergency signal is provided to alert all personnel in the vicinity of the plant that an emergency exists. The emergency alarm signal may be activated manually from the Control Room. The emergency alarm consists of a distinct steady-tone signal sounded through the station and security area intercom system. The alarm shall be sounded for ten (10) seconds followed by an emergency announcement with directions for station personnel, visitors, and contractors. This announcement will be made twice. The alarm will then be reactivated for an additional two (2) minutes.

B. Each site employee, security officer, visitor, and contractor is assigned a designated assembly area, and each area is assigned a supervisor. The Designated Assembly Area Supervisor (DAAS) shall notify the Security/Administration/Logistics Coordinator of personnel accountability.

1. Upon arrival and check-in, CNS visitors receive instructions explaining what they are to do and where they are to go in the event of the sounding of the Site Emergency Alarm.

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev 1

IV. PREREQUISITES

The Emergency Director declares that the station is in an ALERT, a SITE AREA EMERGENCY, or a GENERAL EMERGENCY status as defined in Emergency Procedure EPIP 5.7.1, "Emergency Classification", or determines that personnel assembly and accountability is desirable.

V. LIMITATIONS

All individuals onsite at the time of the emergency must be accounted for and the names of missing individual ascertained within 30 minutes of the start of the emergency, and are accounted for continuously thereafter.

VI. PRECAUTIONS

It is the responsibility of each supervisor to know the general location of his subordinates at anytime.

VII. EQUIPMENT

None

VIII. PROCEDURE

A. Immediate Actions

1. CNS personnel not engaged in initial emergency response actions shall report to their assigned assembly areas for accountability and further instructions, in accordance with the following:

   a. Operations Personnel - All CNS Operations personnel will report to the Control Room for an accountability check. After this is accomplished, the Shift Supervisor will determine which personnel will remain in the Control Room; nonessential operations personnel will be dispatched to the I&C/Electrical OSC.

   b. Maintenance Personnel - All CNS Maintenance personnel that do not have preassigned emergency response billets, will report to the Maintenance OSC which is located on the 903 foot elevation of the Machine Shop.

   c. Chem/HP Personnel - All CNS Chem/HP personnel that do not have preassigned emergency response billets will report to the HP OSC which is located on the 918 foot elevation of the Office Building in the HP office area.

   d. I&C/Electrical Personnel - All CNS electricians and I&C technicians that do not have preassigned emergency response billets will reports to the I&C/Electrical OSC which is located on the 932'-6" elevation of the Turbine Building in the Instrument Shop.

2. Station security personnel shall respond as follows:

   a. Those assigned to the Central Alarm Station, the Secondary Alarm Station, and at the Security Access Point shall remain at their posts and await further instructions.

   b. Those on routine patrol shall report to the Security Building unless the emergency is security-related. Under this condition, security personnel shall follow the appropriate CNS security plan procedures.

3. All nonessential CNS personnel shall proceed to the Security Building exit and then to the auditorium for assembly.

4. CNS visitors, construction and contractor personnel shall evacuate to the Security Building Auditorium.

5. CNS escorted visitors shall be escorted to the Security Building and instructed to report to the auditorium. Accountability will be maintained by checking off those escorted visitors against the visitor sign-in log maintained at the security office. Escorts themselves will then proceed to their own emergency assembly areas.

B. Subsequent Actions

1. The Security Shift Supervisor will ensure that the Security Access Point is manned.

2. The Security Shift Supervisor will obtain copies of the computer printout and of the visitor access log which will provide a listing of all personnel who should be on site.

3. The DAAS for the Control Room, TSC, OSCs, and EOF obtains a copy of the Area Roster Sheet which contains the names and badge numbers of all individuals who should have reported to the area. Utilizing the information contained on the Roster Sheet, he determines if any individuals are missing; if this situation exists the DAAS fills out Attachment A. The DAAS then calls the Security/Administration/Logistics (S/A/L) Coordinator and informs him that all personnel are accounted for or that a person(s) is missing.

4. All nonessential personnel, visitors, contractors, etc., will report to the DAAS in the Security Building Auditorium. The DAAS utilizing a copy of the visitor access log will determine accountability of the visitors present. He will then contact the S/A/L Coordinator and inform him of all personnel assembled.

5. If individuals are not accounted for, the S/A/L Coordinator has the individuals' names announced over the station intercom system, requesting response. If there is no response, a rescue and reentry operation will be performed in accordance with EPIP 5.7.15, "Rescue and Reentry."

6. The S/A/L Coordinator completes the "Summary of Personnel Accountability and Assignments" log sheet, Attachment B, and forwards the completed attachment to the Emergency Director.

7. The S/A/L Coordinator will inform the Emergency Director of accountability within 30 minutes of the start of the emergency.

C. Ongoing Accountability

1. In general, the Emergency Director will order any necessary relocations or evacuations of assembly areas as appropriate. The DAAS for each area may relocate personnel if deemed necessary for personnel safety (e.g., if the Area Alarm Monitor and/or the Continuous Air Monitor alarms, and the results of the habitability survey indicate that the TSC, OSCs, or EOF should be evacuated).

2. Additional personnel required for emergency response will be relocated, on order of the Emergency Director, to an Operational Support Center to await job assignment.

3. Non-CNS personnel will be granted access to the station only on the authorization of the Emergency Director.

D. Assembly Areas

The first person listed in each group below is designated as the primary DAAS to be responsible for the accountability of personnel at each assembly area. Using a telephone or a runner, he shall inform the Security/Administration/Logistics Coordinator (the Security Coordinator) of the status of his area as soon as practicable.

1. Control Room

a. Shift Supervisor (Emergency Director)
b. Operations Supervisor
c. Control Room Operators
d. Station Operators
e. Other Operations Personnel

2. Technical Support Center

a. Administrative Supervisor (Security/Administration/Logistics Coordinator)
b. Station Superintendant (Emergency Director for ALERT)

c. Engineering Supervisor (Eng. Coord. for ALERT, TSC Director for higher level classification)
d. Reactor Engineer (Eng. Coord. for SITE AREA EMERGENCY and above)
e. Maintenance Supervisor (Maintenance and OSC Coordinator)
f. Administrative Assistant (Admin. Coord. for SITE AREA EMERGENCY and above)
g. Chemistry & H.P. Supervisor (C&HP Coordinator for ALERT)
h. Plant Chemist (Chem/HP Coordinator for SITE AREA EMERGENCY and above)
i. Assistant to Station Superintendent
j. Resident NRC Inspector
k. Maintenance Planner and Scheduler
l. Mechanical Engineer
m. Electrical Engineer
n. I/C Engineer
o. Engineering Technician (Technical Data Technician)
p. Technical Assistant to Station Superintendent

3. I&C/Electrical OSC

a. I&C Supervisor (OSC Supervisor)
b. Electrical Foreman
c. All Onsite Electricians
d. All Onsite I&C Technicians
e. Relocated Operations Personnel

4. Maintenance OSC

a. Mechanical Supervisor (OSC Supervisor)
b. Mechanical Foremen
c. All onsite Mechanics

5. HP OSC

a. Plant Health Physicist (OSC Supervisor in ALERT)
b. Plant Chemist
c. All onsite Chemistry Technicians
d. All onsite HP Technicians

6. Security Building Auditorium

a. Administration, QA, TC Personnel
b. All Engineers not designated in 2. above
c. All visitors, Contractors, Construction Personnel
d. All other onsite personnel not designated.

7. Emergency Operations Facility

a. Administrative Supervisor (S/A/L Manager)
b. Station Superitendent (Emergency Director)

c. Chem and HP Supervisor (Radiological Manager)
d. Day Shift Supervisor No. 1 (Operations Advisor)
e. Health Physicist (Radiological Assessment Coordinator)
f. Public Information Manager (Public Information Manager)
g. Communications Specialist (Communications Manager)
h. General Office Project Engineer (Contract Support Manager)

D. Miscellaneous

If an emergency occurs during an evening, or on a weekend or holiday, the same areas used during working hours shall be utilized. However, personnel who are off-site at the time of the emergency and are notified to report to the site to assist in recovery operations shall be instructed as to where they should report when notified. If no instructions are given, personnel reporting to the site shall proceed immediately to the Security Building.

IX. ATTACHMENTS

Attachment A, "Individual Accountability Sheet"

Attachment B, "Summary of Personnel Accountability and Assignments"

ATTACHMENT A

INDIVIDUAL ACCOUNTABILITY SHEET

DATE _____

AREA ACCOUNTABILITY SUPERVISOR _____ _____

MISSING INDIVIDUALS

NAME	BADGE NO.	REMARKS (LAST KNOWN WHEREABOUTS)

ATTACHMENT B

SUMMARY OF PERSONNEL ACCOUNTABILITY AND ASSIGNMENTS

By_____ Date_____

INITIAL PERSONNEL ACCOUNTABILITY

Control Room

Conducted by_____ Report in at_____ hrs.
No. of People_____
Missing_____
Injured_____
Remarks_____

Technical Support Center

Conducted by_____ Report in at_____ hrs.
No. of People_____
Missing_____
Injured_____
Remarks_____

Maintenance OSC

Conducted by_____ Report in at_____ hrs.
No. of People_____
Missing_____
Injured_____
Remarks_____

I&C/ Electrical OSC

Conducted by_____ Report in at_____ hrs.
No. of People_____
Missing_____
Injured_____
Remarks_____

ATTACHMENT B (Continued)

SUMMARY OF PERSONNEL ACCOUNTABILITY AND ASSIGNMENTS

By _____ Date _____

INITIAL PERSONNEL ACCOUNTABILITY

HP OSC

Conducted by _____ Report in at _____
No. of People _____
Missing _____
Injured _____
Remarks _____

Security Building Auditorium

Conducted by _____ Report in at _____
No. of People _____
Missing _____
Injured _____
Remarks _____

EOF

Conducted by _____ Report in at _____
No. of People _____
Missing _____
Injured _____
Remarks _____

I. PURPOSE

A. To provide an efficient means for evacuation of nonessential personnel from isolated areas or from the plant site in its entirety.

B. To provide a definition of the duties and responsibilities of designated supervisory personnel associated with site evacuation.

II. DISCUSSION

A. In the event of an emergency situation at CNS, it may be desirable to minimize the number of nonessential personnel onsite. If the emergency involves a radiological release or the potential for a release, then evacuation of nonessential personnel is desirable, or may be required, to minimize exposure to radioactive material.

B. The organization of this procedure provides guidance in three distinct areas:

1. Determination of the need for site evacuation.

2. Determination of the evacuation route and assembly area.

3. Conducting the evacuation and subsequent assembly, monitoring and release of personnel in an orderly manner.

The first two of these areas are provided in the section "Emergency Director." The latter is provided in the section "Evacuation Coordinator."

C. This procedure is intended to apply to evacuations where persons may receive abnormal external exposure and/or persons or automobiles may be contaminated. It is recognized that in the event of an emergency it may be desirable to send persons home before they are exposed to significant radiation and/or contamination levels. An orderly sequence of dismissal should be given by the Emergency Director.

D. Personnel on site will assemble at their designated assembly areas following sounding of the emergency alarm in accordance with Emergency Procedure EPIP 5.7.10, "Personnel Assembly and Accountability." This action will result in essentially all personnel onsite assembling in one of seven locations.

1. Control Room
2. Technical Support Center

3. Maintenance OSC
4. I&C/Electrical OSC
5. HP OSC
6. Security Building Auditorium
7. Emergency Operations Facility

A list of plant staff personnel assembled will be developed as will a list of unaccounted for personnel in accordance with Emergency Procedure EPIP 5.7.10, "Personnel Assembly and Accountability."

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev 1

C. 10CFR20

IV. PREREQUISITES

A. Emergency conditions, such as fire, security threats, radiological conditions, etc., exist where the Emergency Director deems it necessary to evacuate nonessential personnel from the station.

V. LIMITATIONS

A. A SITE AREA EMERGENCY or GENERAL EMERGENCY has been declared in accordance with EPIP 5.7.1, "Emergency Classification."

B. This procedure assumes the emergency occurs during normal working hours when the greatest numbers of nonessential personnel are onsite. It is also applicable, however, during off-normal hours, weekends and holidays.

C. MPC is the Maximum Permissible Concentration as defined in Column 1, Table I, Appendix B to 10CFR20. This calculation will allow 200 MPC-hrs. which conservatively limits internal exposure. This criteria is based on personnel not wearing respiratory equipment.

VI. PRECAUTIONS

A. As a minimum, the names and addresses of any NPPD evacuees suspected of having received doses in excess of 250 mR and those requiring any decontamination shall be obtained before the persons are allowed to leave the assembly area.

B. Local areas within the station will be evacuated if any of the following conditions exist:

1. Unscheduled alarms from any of the area or airborne radiation monitors.

2. Detection of excessive radioactive surface contamination levels.

3. Other emergency conditions, such as fire, that may endanger human life or health.

C. Monitoring points between CNS and the assembly areas may need to be set up depending upon the emergency condition. This is to prevent the spread of contamination.

VII. EQUIPMENT

None

VIII. PROCEDURE

A. Emergency Director

1. Assess the need for, or the potential need for, evacuation of nonessential personnel. Attachment A, "Evacuation Criteria" provides guidance in making this determination for radiological emergencies. Generally evacuation of nonessential personnel will be conducted for incidents at the SITE AREA EMERGENCY or GENERAL EMERGENCY Classification Levels regardless of whether a release is occuring.

2. Appoint an Evacuation Coordinator to supervise the evacuation.

3. Designate the evacuation route and offsite evacuation assembly area. Attachment B, "Evacuation Route Determination", provides guidance in this determination.

4. Direct the notification of the Nemaha County EOC or the Nemaha County Sheriff's Office of the evacuation.

a. Notification of the intent to evacuate personnel including:

1) The intended evacuation route.

2) The designated offsite assembly area, if other than the AEOF.

3) The approximate number of personnel and vehicles to be evacuated.

4) The anticipated need for any decontamination of personnel or vehicles will be coordinated with the Nemaha County decontamination center.

5. Determine the personnel to be retained onsite and personnel to be assigned to offsite emergency response locations or relief shift duty. In general, personnel other than operations retained onsite will have chemistry, radiation protection, or maintenance assignments for the site emergency organization.

6. Provide evacuation instructions to the Evacuation Coordinator. These instructions should include:

a. Evacuation route

b. Offsite assembly area if other than AEOF

c. Anticipated vehicle or personnel monitoring and decontamination requirements.

d. Arrangements with offsite response agencies.

e. Personnel to remain onsite.

B. Evacuation Coordinator

1. The basic responsibilities of the Evacuation Coordinator are as follows:

a. Coordinate with the Emergency Director to determine the conditions of the emergency and the evacuation plan.

b. Provide information on the number of vehicles and personnel involved in the evacuation and any further personnel accountability required at the site prior to the evacuation.

c. Providing required onsite traffic control measures such as:

1) Notifying security gate of the intended evacuation

2) Sequencing the departure of personnel to avoid congestion.

d. Establish monitoring points along the evacuation route, where and if appropriate.

2. Contact the Chemistry and Health Physics Coordinator and assure that qualified monitoring personnel are dispatched to the monitoring points (either from onsite or offsite). Generally one monitor for each of the areas will be utilized.

3. Provide instruction for personnel evacuating. These generally are:

   a. Proceed in caravan fashion along the designated route to the offsite assembly area.

   b. Personnel without transportation should obtain a ride with a driver in their assembly area.

   c. At the offsite assembly area, each assembly area evacuation leader should assure that personnel are accounted for, and remain to be monitored and cleared before release.

C. Activities at the Monitoring Points

1. Upon arrival at the monitoring points, the monitor(s) shall begin a program of surveying personnel and vehicles for contamination. The results are to be recorded on Attachments C and D. Personnel and/or equipment (vehicles, etc.) that are contaminated in excess of the limits presented in Attachment E must be decontaminated per EPIP 5.7.13. Decontamination of personnel and/or vehicles with contamination levels less than those presented in Attachment E, but higher than two times background will be at the discretion of the radiation monitor(s) at the evacuation area. The overall results are to be reported to the Emergency Director.

2. If parking lots are utilized as the monitoring points, and the lots cannot be completely cleared prior to arrival of evacuees, all vehicles which were originally in the lot will be surveyed before being allowed to leave.

3. As a minimum, the names and addresses of any evacuees suspected of having received doses in excess of 250 mR and those requiring any decontamination shall be obtained before the persons are allowed to leave the monitoring point.

4. In general, personnel shall be given permission to leave the monitoring point, and proceed to the assembly point only after the following conditions are met:

a. The person and his vehicle have been surveyed or a sufficient number of persons in the group have been surveyed in order to determine that radioactive contamination is not a factor.

b. Self-reading dosimeter results have been recorded and the names of exposed persons recorded.

c. The above results have been reported to the Emergency Director for his evaluation.

D. Alternate Assembly Point/Evacuation Assembly Point

1. The Auburn National Guard Armory has been designated as the Alternate Assembly Point to be used in the case that for any reason the Security Building Auditorium cannot be used.

2. If a site evacuation is required, the Armory will be used as an assembly point with monitoring points selected depending upon the emergency conditions.

3. If the onsite decontamination facility is not available, or because of time constraints during an evacuation the facility cannot be used, or interim monitoring points cannot be used, contaminated personnel will be directed either to the National Guard Armory or to the Nemaha County Decontamination Center.

IX. ATTACHMENTS

Attachment A, "Evacuation Criteria"

Attachment B, "Evacuation Route Determination"

Attachment C, "Evacuee Monitoring Data"

Attachment D, "Post Evacuation Vehicle Monitoring Data"

Attachment E, "Emergency Decontamination Limits"

ATTACHMENT A

EVACUATION CRITERIA

The decision to evacuate any, or all, of the personnel covered by this procedure shall be made by the Emergency Director. Personnel shall not evacuate an assembly area unless instructed to do so by the person in charge in the area, and this individual shall, in turn, receive his instructions from the Evacuation Coordinator who, in turn, receives instructions from the Emergency Director.

1. CNS Contract Personnel, Visitors, Clerical Station Personnel

In keeping with "as low as reasonably achievable" philosophy, personnel who are not contributing substantially to emergency response actions (which generally includes visitors, contractors and clerical personnel) should be evacuated if such action can prevent significant exposure, provided that trained personnel are available to conduct the evacuation and can be spared for this task without jeopardizing emergency mitigation activities. However, the following should be considered as a guideline evacuation criteria:

WHOLE BODY DOSE RATE	AIRBORNE ACTIVITY CONCENTRATION[2]	CONSIDER EVACUATION WITHIN
2-10 mrem/hour	1-4 X MPC	48 hours
10-50 mrem/hour	4-20 X MPC	10 hours
50-100 mrem/hour	20-40 X MPC	5 hours
100-500 mrem/hour	40-200 X MPC	1 hour
500 mrem/hour	200 X MPC	Immediately

The decision to evacuate or not must include the following considerations:

a. Whether or not the emergency can be mitigated prior to reaching a dose of 500 mrem or 200 MPC-hrs nonessential personnel. (nonradiation worker criteria).

b. If personnel involved are not immediately essential for handling the emergency, they should be evacuated at levels near the low end of each range to minimize their doses.

ATTACHMENT A (CONT'D)

c. Any time personnel are to be evacuated, the dose expected during evacuation must be weighed against that expected if the person is not evacuated. In some cases, evacuation may result in a higher dose than could be received if the individuals remained in a shielded or protected area.

2. STATION PERSONNEL NOT ENGAGED IN EMERGENCY RESPONSE ACTIONS

In general, nonessential station personnel should be evacuated in conjunction with visitors, contractors, etc., in the event of a general site evacuation under the provisions of 1. above. If their assistance is anticipated to be required, these persons should not be allowed to exceed their occupational quarterly or annual exposure limits (3 rem WB or 5 rem thyroid per quarter, 5 rem WB or 15 rem thyroid per year). Since many of these persons will have received some occupational exposure prior to the accident, the "maximum" exposure which can be permitted may vary depending on the date in the quarter and the exposure history from one person to another.

Essential station personnel may be authorized to receive exposures in excess of established quarterly and annual limits. The Emergency Director has the authority to authorize emergency exposure limits.

ATTACHMENT B

EVACUATION ROUTE DETERMINATION

There are two basic evacuation routes which may be utilized when an evacuation is required. The specific route to be followed shall be determined by the Emergency Director on the basis of wind direction, dose rates, and other pertinent factors existing at the time.

Description of Routes

1. Northern Route Through Brownville

   The preferred route if evacuation from the site is required, is out the access route to Country Road, North on Country Road to Brownville, then West on U.S. Highway 136 to Auburn. The post-evacuation assembly area is located in the Auburn National Guard Armory (AEOF).

2. Southern Route Through Nemaha and Howe

   If radiation levels make the use of the northern evacuation route undesirable, an alternate route to the south is available. The route is South on country road to Nemaha, then South on State Highway to Howe-turnoff. West past Howe to U.S. Highway 73/75, then North to the Auburn National Guard Armory (AEOF).

ATTACHMENT C

EVACUEE MONITORING DATA

LOCATION _____ DATE _____

INSTRUMENT USED _____ BACKGROUND CPM _____

PERSON READING SURVEY _____

NAME	VEHICLE LICENSE NO.	TIME	DIRECT SURVEY RESULTS (MAX) 1st	2nd	MAX READING LOCATION	DOSI-METER READING mrem	TIME RELEASED

ATTACHMENT D

POST-EVACUATION VEHCILE MONITORING DATA

LOCATION _____ DATE _____

INSTRUMENT USED _____ BACKGROUND CPM _____

PERSON MAKING SURVEY _____

LICENSE NUMBER	NUMBER OF PERSONS	TIME	DIRECT SURVEY RESULTS 1st	DIRECT SURVEY RESULTS 2nd	SMEAR SURVEY RESULTS 1st	SMEAR SURVEY RESULTS 2nd	TIME VEHICLE RELEASED

ATTACHMENT E

EMERGENCY DECONTAMINATION LIMITS

	Smearable (dpm/100 cm^2)			Fixed (mr/hr)	
	Beta/Gamma		Alpha	Beta/Gamma	
	Normal Station Operation	Emergency	Emergency	Normal Station Operation	Emergency
Personnel	100	1000		0.1	0.5
Vehicles	100	2200	220	0.1	1.0

I. PURPOSE

The purpose of the procedure is to address required authorization, guidance, and maximum exposure criteria in the event of a radiological emergency where it may be necessary for emergency workers to exceed established quarterly or annual exposure limits.

II. DISCUSSION

Under emergency conditions it may become necessary for emergency workers to receive exposures in excess of occupational limits established by 10CFR20. Emergency dose exposure limits are defined for three categories: 1) lifesaving actions, 2) corrective or protective actions, and 3) sampling under emergency conditions. These exposure limits are contained in Attachment A.

The Emergency Director or his designee has the authority to authorize exposures in excess of occupational limits. These exposures are only justifiable if it is determined that benefits are being achieved, the doses are commensurate with the significance of the objective and every reasonable effort is being made to maintain emergency workers doses "As Low As Reasonably Achievable" (ALARA).

III. REFERENCES

A. CNS Emergency Plan

B. NUREG 0654, Rev. 1

C. "Emergency Exposure Limits" NUREG 0737, November, 1980

D. NCRP Report No. 39, 1971 "Basic Radiation Protection Criteria"

E. ICRP Report No. 59, "Permissible Dose for Internal Radiation" Working Breathing Rate

F. EPA Protective Action Guides, June 1980

IV. PREREQUISITES

A. The Emergency Director may authorize emergency exposures under the following conditions:

1. Lifesaving actions

a. Removal and/or rescue of injured personnel

2. Corrective or protective actions

a. Providing first aid.
b. Providing ambulance service.
c. Providing medical treatment service.

d. Performing personnel decontamination.
e. Undertaking corrective action on station equipment and systems.

3. Sampling under emergency conditions.

a. Collection of inplant airborne and liquid samples.
b. Use of the post-accident sampling system.

Note: The above are examples and not an absolute list, the existing situation may dictate additional conditions.

V. LIMITATIONS

A. Emergency Exposure Limits are contained in Attachment A.

B. Personnel authorized to receive emergency exposures should meet the following criteria:

1. Personnel conducting corrective or protective actions or lifesaving actions who may receive a whole body dose in excess of 12 REM/yr. should be selected on a volunteer basis.
2. Rescue personnel shall be familiar with the hazards of any exposure received under emergency conditions.
3. Women of child bearing age shall not take part in these actions.
4. Personnel should not have received previous emergency exposures. Emergency exposures should be limited to once in a lifetime.
5. Exposures greater than 10CFR20 limits are voluntary.

VI. PRECAUTIONS

A. Protective clothing and/or respirators should be used as appropriate.

B. Potassium Iodide (KI) tablets, if necessary, should be administered in accordance with EPIP 5.7.14, "Stable Iodine Thyroid Blocking".

C. Administrative methods to minimize personnel exposure (such as ALARA) should remain in force to the extent consistent with timely rescue, corrective, and protective actions.

D. Personnel shall wear dosimeters appropriate for measurement of anticipated exposure levels. These shall include:

1. The most appropriate direct reading pencil dosimeter for whole body exposure

a. Low range direct reading dosimeter (0-200mR)
b. Medium range direct reading dosimeter (0-10R)
c. High range direct reading dosimeter (0-200R)

2. TLD dosimeter to permanently record whole body exposures.

3. Extremity monitoring, if the anticipated extremity exposure is greater than three times the projected whole body exposure.

VII. EQUIPMENT

None

VIII. PROCEDURE

A. The Emergency Director or his disignee has the authority to authorize whole body doses in excess of 3 rem but not greater than 75 rem.

B. Personnel Exposure Control

1. Individuals shall not enter any area where dose rates are unknown or unmeasurable with instruments immediately available.

a. If possible, the following survey instruments should be used:

1) High range portable survey instrument, (0.0 to 1000 R/hr).
This should be the instrument of choice.
2) Low range portable survey instrument, (0.0 to 5 R/hr).

b. Meter Use

1) Prior to entering any radiation area allow time for the meter to warm up.
2) Check meter response with a check source.
3) Enter suspected radiation areas with the meter set on the high scale, and switch down as necessary.

C. The Chemistry and Health Physics Supervisor shall:

1. Obtain initial estimates of the radiation dose of exposed personnel as quickly as possible.

2. Exposures in excess of 10 CFR 20 "Occupational Limits" (Attachment B) should be reported immediately to the NRC per 10 CFR 20.403 and 10 CFR 20.405.

3. Update existing SWP's as station conditions change and information becomes available.

IX. ATTACHMENTS

Attachment A, "Emergency Exposure Limits"

Attachment B, "Maximum Permissible Dose Equivalent For Occupational Exposure"

ATTACHMENT A

EMERGENCY EXPOSURE LIMITS

	Sampling Under Accident Conditions	Corretive or Protective Actions	Lifesaving Actions
Whole Body (rem)	5	25	75
Thyroid (rem)	15	125	No Limit*
Extremities (rem)	75	100	200

*Thyroid exposure should be minimized to the extent feasible by the use of respiratory protection and/or thyroid blocking. However, no upper limit is specified for lifesaving action.

ATTACHMENT B

MAXIMUM PERMISSIBLE DOSE EQUIVALENT FOR OCCUPATIONAL EXPOSURE

	Millirems/Quarter	Millirems/Year
Whole Body; Head & Trunk; Active Blood-forming Organs; Lens of eyes; or Gonads	3,000[1]	12,000[2]
Hands	25,000	75,000
Forearms	10,000	30,000
Skin of Whole Body	7,500	15,000
Other Organs, Tissues, and Organ Systems. (Thyroid Included)	5,000	15,000
Fertile Women (with respect to fetus)	500 mR/9 months	

1. 3000 millirem is permitted in a calendar quarter as long as the accumulative occupational dose to the whole body does not exceed 5000 millirem X (Age - 18).

2. Accumulating occupational exposure in excess of 5,000 milirem/yr. is permitted providing 1. above is maintained.

I. PURPOSE

This procedure provides instructions for decontamination of station personnel during emergency conditions utilizing normal decontamination facilities or alternate areas if necessary.

II. DISCUSSION

The objectives of personnel decontamination techniques are; to promptly reduce radiation exposure, to minimize the absorption of radionuclides into the body, and to prevent the spread of localized contamination.

All personnel and their clothing shall be free of significant surface contamination before they leave their assembly area after an emergency condition has been determined. If contaminated, they will proceed to a decontamination facility. Contamination levels will be assessed by evaluating known plant conditions during the emergency (i.e., amount and direction of any radioactive release), and personnel monitoring. The need to improvise decontamination facilities may be necessary during emergency conditions in the event large numbers of people become contaminated or have to be initially evacuated from the site.

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev. 1

IV. PREREQUISITES

Personnel are suspected or known to be contaminated.

V. LIMITATIONS

A. MEDICAL ATTENTION TO SERIOUS INJURIES TAKES PRIORITY OVER THE REMOVAL OF CONTAMINATION OR RADIATION CONTROL.

B. Decontamination Supplies are maintained at the following Decontamination Sites.

1. Onsite Decontamination Area (918' Elev, East of HP Office)

2. Emergency Operations Facility (Security Building)

3. Alternate Emergency Operations Facility (National Guard Building, Auburn)

VI. PRECAUTIONS

A. Prevent the Spread of Contamination

B. If possible, no one should leave CNS contaminated.

C. Personnel with the highest levels of contamination should receive priority in the decontamination process.

D. Personnel monitoring areas should have a low background level.

E. Wear appropriate protective clothing as necessary during decontamination procedures.

F. Do not brush or scrub an area with enough force to erode or break the skin.

VII. EQUIPMENT

None

VIII. PROCEDURE

A. Prepare Decontamination Sites (if normal decontamination facility is not available).

1. Personnel monitoring areas should have a low background level.

2. Establish controls in the decontamination area. Take measures to avoid the further spread of contamination.

3. Provide water supply to area with hoses if necessary.

a. Select a suitable location where drains will be routed to the radwaste drain system.

b. If no drains leading to the radwaste system are available, collect liquid waste in 55 gallon drums.

4. Assemble individuals that need to be decontaminated.

5. Provide a clean pathway out of the decontamination area with a control exit point for personnel monitoring after decontamination.

6. If onsite decontamination areas are unavailable, and temporary offsite decontamination facilities have to be improvised:

a. Select an area where contaminated drains can be collected, (i.e., swimming pool, low point in paved parking lot or a hole covered with plastic) or utilize the vinyl swimming pools.

b. Establish controls in the decontamination area.

c. If a local water supply is not available, arrange for a water truck.

d. Provide a control entry and exit point arranged to minimize the spread of contamination.

B. Take measures to avoid further spread of contamination while personnel are in transit to the decontamination area.

C. Personnel Monitoring

1. The methods and instruments used for personnel contamination do not significantly differ from those used for other contamination surveys. The following precautions should be followed:

a. Do not contaminate the probe by allowing it to come in contact with the person.

b. If necessary, cover the probe with plastic.

c. Due to the response time of most monitors, pass the probe of the G-M survey meter slowly over the area to be monitored.

2. To determine if personnel decontamination is necessary, refer to Attachment A. If the limits are such that decontamination is necessary, proceed as described below.

D. Decontamination of Personnel

1. Personnel with the highest levels of contamination should receive priority in the decontamination process.

2. Skin Decontamination Techniques

Localized Skin Decontamination

a. Survey, paying particular attention to fingernails and skin folds.

b. Record survey results on Attachment B.

c. Localize area of contamination with plastic sheet or other suitable material and tape to prevent contamination spread.

d. Wipe off loose contamination.

e. Wash contaminated area with a mixture of detergent and septisol. The mixture is removed using cotton gauze or cotton swabs.

f. Rinse, pat dry, and resurvey. Record results on Attachment B.

g. If after two washings contamination is still present or the level of contamination does not appreciably decrease, gently scrub the area with a brush using a thick solution of detergent and septisol. Do not break or erode the skin. Resurvey and record results.

h. If after a single scrubbing, contamination is still present apply a thick paste of titanium dioxide and water, keep moist. Remove the paste after two minutes, wash with soap and water. Resurvey and record the results.

i. If contamination persists, paint the skin with 4 percent solution of potassium permanganate. Paint three times allowing each application to dry. Wash. Resurvey and record the results.

NOTE: The skin discoloration may be removed with a 4 percent solution of sodium bisulfite.

Skin Breaks

a. Survey, record results on Attachment B.

b. Irrigate wound with copious amounts of water making sure no contamination is washed into the wound.

c. Carefully decontaminate intact skin surface around wound.

d. Continue irrigation with water until no radioactivity is detected.

e. Perform first aid measures, and if necessary, seek medical attention.

f. Contact the Chemistry/Health Physics Supervisor.

2. General Body Decontamination Techniques

Step I

a. Survey entire body and record on Attachments B and C.

b. Mark very high level areas to receive priority.

c. Contaminated persons should shower.

1. Make effort not to contaminate hairy areas if initially free of radioactivity.

2. Use precautions to prevent contamination from entering body openings.

d. Resurvey entire body, again marking highest levels found.

Step II

a. For general body contamination with high levels of radioactivity, localized areas of contamination usually remain. When showering becomes ineffective and localized areas of contamination remain, shift to localized skin decontamination technique.

b. Repeat surveys and record results frequently.

3. Hair Decontamination (Under Direction of Health Physics)

a. Survey and record results.

b. Have the individual put on a pair of surgeons' gloves.

c. Wrap or position individual to avoid spread of contamination.

d. Carefully examine the skin in the area of contamination for cuts and abrasions. If cuts are present:

1. Wearing surgeon gloves and using scissors carefully trim the hair from the wound and save for survey.

2. Use cotton or gauze and/or an applicator and using tepid water gently clean the area. Use Septisol and only enough water to moisten the area and pick up the contamination.

3. Perform first aid measures, and if necessary, seek medical attention.

e. If there is no wound:

1. Have the individual massage soap mixture into hair with gloved hands, rinse.

a. Use waterproof goggles and towels to prevent contaminating the face, eyes, neck, nose, mouth or ears.

2. Dry with clean uncontaminated towel.

3. Survey the hair, face and neck after the hair is dry.

4. Mouth Decontamination

If the mouth is generally contaminated, begin flushing immediately with water. Keep head bent down to prevent water from reaching the throat and being swallowed. Contact the Chemistry/Health Physics Supervisor immediately.

5. Eye Decontamination

Apply the same principles as for mouth decontamination. Shift to normal saline as soon as possible. Contact the Chemistry/Health Physics Supervisor immediately.

6. Nose Decontamination

a. DO NOT perform any nasal irrigation.

b. Obtain a direct beta/gamma radiation measurement at the nostrils before the individual blows nose or otherwise clears it. This measurement should be while exhaling.

c. Obtain nasal smears using "Q" tips. Two smears should be taken in each nostril. The first one dry and the second wet. Place in a plastic bag and mark for gamma/beta analysis.

d. Have individual blow nose repeatedly.

e. Resurvey using above technique.

f. Contact the Chemistry/Health Physics Supervisor immediately.

E. Personal Effects Decontamination

1. To determine if decontamination of personnel effects is necessary, refer to Attachment A. If decontamination is deemed necessary, proceed as discussed below.

2. Shoes

a. If it is suspected that the contaminant is particulate matter, masking tape may remove it. Press the gummy side of the tape to the area of the shoe that is contaminated. Remove and repeat until no substantial reduction in radiation level is observed or until the shoe is free of contamination.

b. If the contamination cannot be removed with tape, leather soles should be scraped with a wire brush or emery paper until clean.

c. If contamination cannot be removed with tape, rubber soles may be scrubbed with decontamination soap. A wire or stiff bristle brush should be used. Wipe off, rinse, dry and resurvey. Repeat if necessary.

d. Wire brushes should be washed with clean soapy water to prevent the spread of contamination.

e. Shoes that cannot be decontaminated by these methods should be confiscated, placed in a plastic bag, and labeled. Disposition of contaminated shoes is to be left to the discretion of the Chemistry/Health Physics Supervisor.

3. Personal Clothing

a. Contaminated clothing will be confiscated, placed in a plastic bag and labeled. Disposition of all clothing will be left to the discretion of the Chemistry/Health Physics Supervisor. Record results on Attachment B.

b. A body survey for skin contamination will be made.

c. Temporary clothing will be issued.

F. Decontamination of Equipment

1. Methods of Decontamination

a. Depending upon the type and location (i.e., onsite vs. offsite) of the equipment to be decontaminated, there are a number of decontamination methods which may be employed. A summary of these methods is described below.

1) Manual Cleaning

Manual cleaning includes such procedures as wiping, scrubbing, mopping, etc., and in general, is an effective method of removing low or moderate levels of contamination on nonporous or nearly nonporous surfaces. Water or a variety of detergents, solvents, chelating agents, and other chemicals may be used. Manual cleaning usually presents minimal airborne and surface contamination control problems.

2) Mechanical Cleaning

Mechanical cleaning includes such decontamination methods as vacuuming, high-pressure steam and water cleaning, soaking, and ultrasonics. These methods are generally associated with the decontamination of highly contaminated equipment but have application with lower levels of contamination.

a) Vacuuming, Wet or Dry. Vacuuming is generally effective in removing loose particulate contamination and is frequently used as an initial decontamination step preparatory to manual cleaning. Vacuum systems should be properly filtered to prevent the spread of contamination to surrounding areas and to reduce the hazard of airborne contamination. Care should be taken to ensure that the concentration of radioactive material in the vacuum system does not create unusually high radiation exposure rates to personnel and that it does not present a criticality hazard.

b) Jet Cleaning. High-pressure steam and water used alone or mixed with chemicals and detergents are effective in attaining high decontamination factors. Commercial systems using the jet cleaning principle are available. Equipment of this type is ideally suited for remote operation and for cleaning large surface areas. High-pressure jet cleaning has the disadvantage of spreading contamination over a large area and is more effective when used in a cave or cell designed especially for this purpose.

c) Soaking and Spraying. Soaking and spraying are used extensively for decontamination of small and moderate size material and equipment. Both methods make use of chemical solutions and may require support features such as catch tanks, liquid recycle ability, and filtered ventilation systems. Spraying has the advantage of combining mechanical as well as chemical action; however, in some cases the shape of the object being cleaned prevents effective cleaning action on all surfaces. Soaking provides good access to surfaces but does not provide mechanical action.

d) Ultrasonic Cleaning. Ultrasonic cleaning combines the advantage of chemical action and mechanical energy for cleaning. It is best suited for small components and offers the advantage of remote operaton and rapid decontamination of objects with irregular shapes and crevices.

3) Grinding and Abrasive Action

Cleaning procedures employing grinding or abrasive action are effective means of decontaminating metal and concrete surfaces, provided alteration of the surface area of the object being cleaned can be tolerated.

a) Grinding. Grinding of surfaces to remove contamination is usually limited to small objects or isolated spots of contamination where the surface is reasonably smooth. Grinding normally produces a high decontamination factor and is economical. A variety of commercial grinders may be used. Grinding inherently leaves residual contamination on the surface of the object being cleaned and therefore usually requires final cleaning by some other method (vacuuming, wiping, etc.).

b) Abrasive Blasting. Abrasive blasting has a number of advantages over grinding. It is rapid, provides a high DF, is effective on irregular shaped surfaces and can be used for large areas. Abrasive blasting makes use of a large variety of abrasives (sand, shells, glass beads, metals, etc.) with velocity, shape, and size of the abrasive influencing surface-

removal characteristics. A prime disadvantage of abrasive blasting is that it usually generates high airborne contamination and spreads surface contamination; however, this can be minimized by wet blasting techniques, vacuum systems, or filtered enclosures.

c) Destructive Decontamination. Destructive decontamination procedures include physical removal of contaminated parts or sections. Generally, little or no effort is made to clean the contaminated parts before disposal as waste. Containment and other radiological controls associated with destructive cleaning are dependent on contamination levels, the nature of the contaminant, and the physical characteristics of the parts being removed.

2. Decontamination Efficiencies

a. Attachment D provides information on decontamination efficiencies for a variety of hard surface materials.

G. Waste Disposal

1. Contaminated fluids will be collected in receptacles (55 gallon drums) if normal decontamination facility or radwaste drains are not available.

2. Contaminated disposable supplies will be placed in plastic bags.

3. Contaminated equipment will remain in the area until decontaminated or processed as radioactive waste.

IX. ATTACHMENTS

Attachment A, "Emergency Decontamination Limits"

Attachment B, "Survey Report - Personnel Decontamination"

Attachment C, "Body Map"

Attachment D, "Hard Surface Decontamination Efficiencies in Percent"

ATTACHMENT A

EMERGENCY DECONTAMINATION LIMITS[1]

	Smearable, ($dpm/100\ cm^2$)			Fixed (mr/hr)	
	Beta/Gamma		Alpha	Beta/Gamma	
	Normal Station Operation	Emergency	Emergency	Normal Station Operation	Emergency
Personnel	100	1000		0.1	0.5
Personnel Effects/ Equipment/ Area[2]	100	2200	220	0.1	1.0

Note:

[1] If contamination levels are less than those provided above, the decontamination procedures do not have to be implemented.

[2] If equipment contamination is such that it approches the values presented above, it should not be utilized unless its use is critical to emergency response activities.

ATTACHMENT B

SURVEY REPORT - PERSONNEL DECONTAMINATION

Name (TLD) Badge Number Date

Area Job Location Job When Contaminated

Time Date Instrument Measurement Survey By

Skin Condition Before Decontamination

Description (Body Part)	Beta/Gamma mrem/hour	Alpha mrem/hour	Neutron mrem/hour	Contamination Before mrem/hr	Contamination After mrem/hr

Survey #_____ (1, 2 etc.)

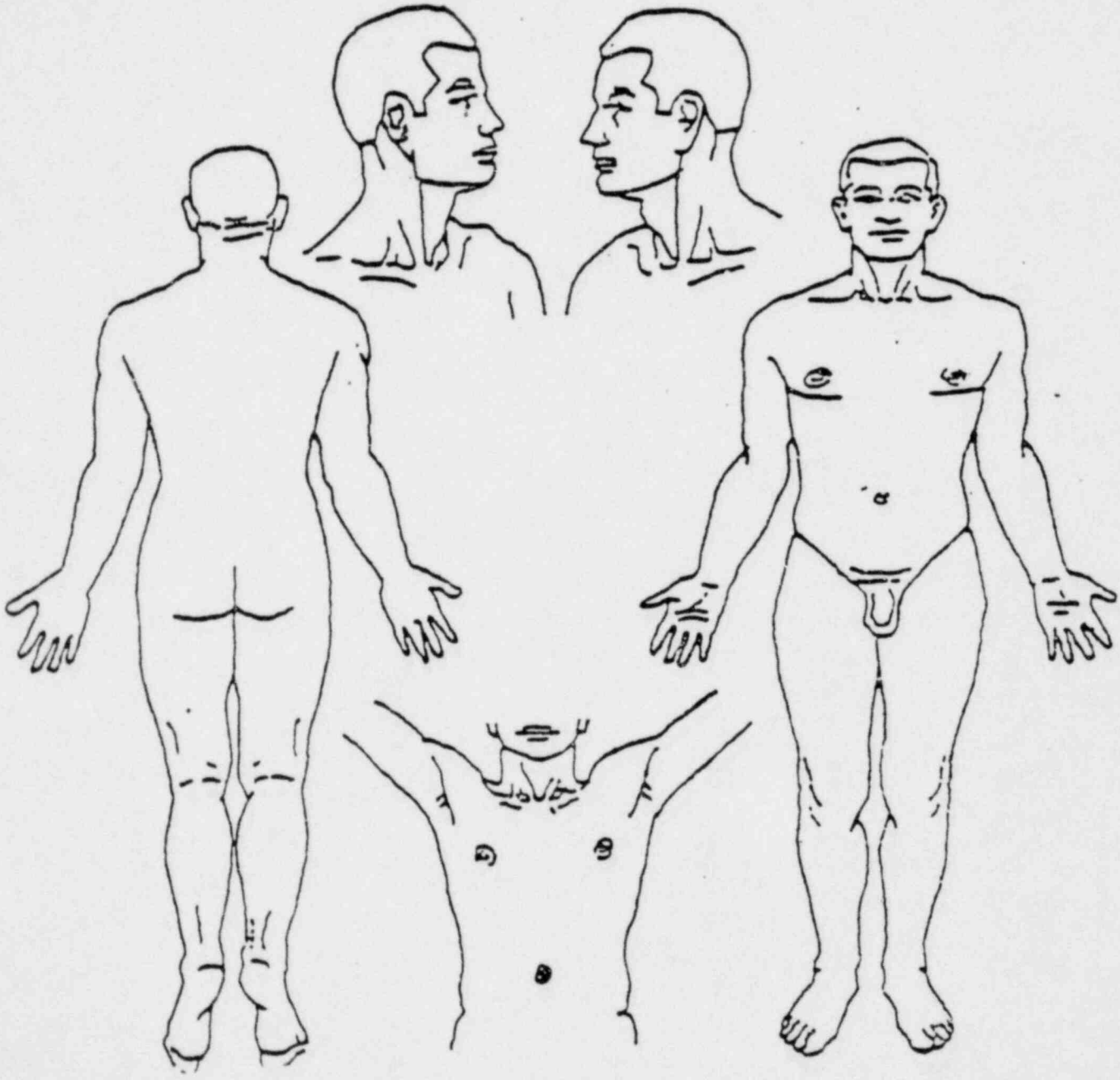
Decon Solutions Used: _____

Skin Condition After Decon: _____

Comments and Recommendations: _____

Sheet_____ of_____ Reviewed By: _____

INDICATE WOUNDS AND/OR
CONTAMINATED AREAS



NAME: _____

TIME/DATE _____

ATTACHMENT D

HARD SURFACE DECONTAMINATION EFFICIENCIES IN PERCENT[a]

Material	Vacuum (D+2)[b]	Hi-Pressure Water (D+3)[b]	Hi-Pressure Wtr.w/Scrub (D+12)[b]	Hi-Pressure Wtr. & Detergent (D+4)[b]	Hi-Press. Wtr. & Detergent with Scrub (D+5)[b]	Sand-blasting (D+9)[b]	Steam Cleaning (D+14)[b]
Glass	98.95	98.85	97.79	100.00	99.76	100.00	97.86
Stucco	48.00	97.94	95.22	100.00	99.59	100.00	27.00
Painted Wood	99.28	98.43	96.77	99.69	99.97	100.00	91.61
Unpainted Wood	36.00	85.00	93.18	99.54	95.54	99.90	85.00
Aluminum	89.00	99.45	97.33	99.62	100.00	98.49	84.00
Plate Steel	93.04	97.26	94.19	100.00	93.83	99.72	91.46
Asbestos Shingles	61.00	99.97	98.91	96.89	99.36	100.00	63.00
Unpainted Wood Shingles	61.00	97.16	90.49	95.01	57.93	99.82	71.00
Brick	29.99	99.46	99.32	99.14	99.56	99.92	97.50
Tarpaper	55.00	98.66	95.04	95.32	95.83	99.51	52.00
Galvanized Roofing	89.00	99.36	97.19	99.73	99.86	100.00	85.00
Highway Asphalt	32.00	99.90	96.25	90.82	99.48	99.90	44.00
Highway Asphalt (10x10 ft.)	72.00	92.45	94.95	98.85	96.34	92.73	22.00
Steel Asphalt	71.00	98.67	90.00	100.00	99.72	99.61	84.00
Steel Asphalt (10x10 ft.)	64.00	90.00	82.00	96.31	97.54	90.42	48.00
Steel Trowel Concrete	74.00	98.94	--	96.91	99.53	100.00	--
Steel Trowel Concrete (10x10 ft.)	--	73.00	97.34	--	99.58	98.96	27.00
Wood Float Concrete	--	98.00	92.03	100.00	97.47	100.00	65.00
Wood Float Concrete (10x10 ft.)	56.00	97.84	--	98.09	98.28	98.78	85.00
Average of all Surfaces	65.40	96.12	94.59	98.61	98.64	98.83	67.80

[a] Decontamination factor (DF) - 100/[100 - decontamination efficiency (%)]

[b] (n/a) = number of days between contamination and decontamination

MANN 1400, Appendix XI, October, 1979, "Nuclear Safety Study."

I PURPOSE

The purpose of this procedure is to define (1) under what emergency conditions Potassium Iodine (KI) should be adminiatered to station personnel, and (2) who has the authority to determine when, and at what dosages, it should be taken.

II. DISCUSSION

A. Effectiveness

KI is an effective means of blocking iodine from the thyroid gland. If possible, it should be administered approximately one-half hour to one day before exposure for maximum blockage. Final uptake is halved if KI is administered within 3-4 hours after exposure. Little benefit is gained if it is administered 10-12 hours after exposure.

B. Dosage

Once taken, and the concentration is verified or estimated by dose calculations, the tablets should be taken for ten (10) days post-exposure. Dosage is one tablet per day. Individuals suspected of inhalation of airborne contaminant should receive thyroid counts on a regular basis throughout the KI treatment period to verify effectiveness of treatment and to estimate dose commitment.

C. Precautions/Side Effects

Potassium Iodine should not be used by individuals allergic to iodine. Usually side effects occur when the dose is higher than that recommended, for a long period of time. Possible side effects include skin rashes, swelling of the salivary gland, and "iodism" (metallic taste, burning mouth and throat, sore teeth and gums, symptions of a head cold, and sometimes stomach upset and diarrhea). If the side effects are severe, or if an allergic reaction is experienced, stop taking KI and contact a doctor for further instruction.

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev 1

C. NCRP 55, Protection of the Thyroid Gland in the Event of Release of Radioiodine, National Council on Radiation Protection and Measurements, 1977.

IV. PREREQUISITES

A. Potassium Iodine is to be administered:

1. Whenever a calculated iodine dose of 10 rem or greater to the thyroid is likely to be received.

2. If possible, prior to undertaking a life-saving operation where high levels of radioiodine are suspected, and no current air analysis is available.

V. LIMITATIONS

Refer to Section II for information on effectiveness and dosage.

VI. PRECAUTIONS

1. KI should not be administered to personnel allergic to iodine.

2. The taking of KI is on a voluntary basis.

VII. PROCEDURE

A. The Emergency Director, acting on the recommendations of the Radiological Manager, will determine when and to whom KI may be administered.

B. The Radiological Assessment Manager, or his designee will:

1. Obtain bottle(s) of 130 mg KI tablets from the Control Room TSC, EOF or AEOF emergency supplies.

2. Dispense one tablet to each individual that has an emergency team assignment and may potentially enter a high-level airborne radioiodine environme.

3. Ensure that records (Attachment A) are maintained for those individuals which received KI tablets.

VIII. ATTACHMENTS

Attachment A, "Record of Potassium Iodine Distribution"

RECORD OF POTASSIUM IODINE DISTRIBUTION

DATE/TIME	NAME	SOCIAL SECURITY NO.	ORGANIZATION

I. PURPOSE

A. The purpose of this procedure is to provide the guidance and requirements necessary to conduct efficient rescue and reentry operations.

B. Topics covered in this procedure are:

1. Organization and operation of rescue and reentry teams.

2. Precautions observed by rescue and reentry teams, including equipment carried during search & rescue operations.

II. DISCUSSION

A. During a station emergency, abnormally high levels of radiation and/or radioactivity may be encountered. These levels may range from slightly above those experienced during normal station operation to life-endangering levels of several hundred Rem in a short period of time (e.g., spent fuel cask accident, or loss of coolant accident). Under all emergency situations, whether it is immediate action to regain control of the emergency or for life-saving purposes, care should be taken to minimize personnel exposure from external and/or internal sources of radiation whenever practicable.

B. Specific exposure guidelines for entry or re-entry into areas in order to (1) remove injured persons, and (2) undertake corrective actions, are defined in Attachment 3. The Emergency Director will authorize emergency dose guidelines consistent with these or more restrictive dependent upon emergency conditions. Radiological concerns will be discussed with rescue teams prior to undertaking any rescue mission.

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev 1

C. 10CFR20

IV. PREREQUISITES

A. Personnel are known to be missing or in need of help.

B. All Rescue and Reentry Team members have been briefed on the hazards of radiation exposures in excess of 25 rem.

V. LIMITATIONS

A. All Rescue and Reentry Team members will participate on a strictly voluntary basis.

B. No team member shall receive a whole body dose greater than 75 Rem (whole body) while conducting search and rescue operations.

VI. PRECAUTIONS

A. During any emergency involving radiological hazards, exposure to personnel should be minimized consistent with the nature of the emergency response required.

B. The Radiological Manager will obtain approval from the Emergency Director for team members to obtain doses in excess of 5 Rem up to 75 Rem.

C. All planned exposures in excess of CNS Station administrative limits or 10CFR20 limits shall be approved by the Radiological Manager and the Emergency Director prior to receiving the exposure. Radiation exposures of Rescue and Reentry Team members are not to exceed 75 Rem whole body under any circumstances.

D. The Radiological Manager or Emergency Director, will determine if Potassium Iodide administration is necessary in accordance with EPIP 5.7.14, "Stable Iodine Thyroid Blocking", and shall administer it if necessary to the Rescue and Reentry Team members.

E. A Health Physics Technician is equipped with a high range beta-gamma dose rate meter and monitors radiation levels at all times during the search and rescue operations.

VII. EQUIPMENT

A. The Rescue and Reentry Team Leader will ensure that the team is equipped with the necessary protective equipment as shown in Attachment A, "Protective Equipment".

B. In addition to the emergency fire fighting and protective equipment, a special Rescue Tool Cabinet is maintained in the Machine Shop. To assure ready availability, the equipment contained in this cabinet is reserved for EMERGENCY RESCUE USE ONLY. A list of this equipment is shown in Attachment B, "Emergency Rescue Equipment".

VIII. PROCEDURE

A. Personnel Search and/or Rescue

1. Immediate Life-Saving Rescue Required

a. Within the limits allowed by the urgency of the situation, make every reasonable effort to obtain as much of the following:

1) pertinent information (i.e., what happened, what may happen, what hazards are present, what can be done, etc.).

2) available protective and monitoring equipment and possible rescue devices.

3) backup assistance from others nearby or request assistance.

b. Evaluate available information and discuss best apparent rescue approach with the Radiological Manager prior to attempt if practicable.

c. If available, other personnel in the area should render assistance and monitor the time rescuer(s) is in a high radiation area.

d. Perform rescue mission consistent with good first aid practices and as dictated by dose rates encountered and the limits discussed above.

NOTE: Work as quickly as is consistent with safety and avoid sources of high dose rates within the rescue area, whenever practicable.

e. Limit exposure of rescuers in accordance with Attachment C, Condition 4.

2. Organized Search and Rescue - following a personnel accountability check.

a. Upon notification of missing personnel, the Security/ Administration/Logistics Coordinator will page on the Gaitronics to determine if missing personnel may be unharmed, but isolated in some area of the plant or plant site.

b. The Emergency Director will direct the Radiological Manager and the Maintenance & OSC Coordinator to assemble a Rescue and Reentry Team.

c. The Rescue and Reentry Team quickly assembles needed equipment, and assembles at the designated Point of Reentry.

d. Conduct a search, keeping all members of the team in the same general area (i.e., frequent visual checks, each searching independently).

e. When a victim or victims are located, notify the Technical Support Center immediately. This should be followed up with additional relevant information (i.e., nature and extent of injuries, dose rates encountered, etc.) as this information develops.

f. Limit exposure of rescuers to as low as reasonably achievable but not to exceed the appropriate level specified in Attachment C.

g. Treat victims in accordance with EPIP 5.7.24, Medical.

B. Entry and/or Reentry Activities

1. Actions to correct or mitigate further station degradation

a. The Control Room, or Technical Support Center, requests assistance from the Operations Support Centers or the Emergency Operations Facility by specifying:

a. The problem and its location; and
b. The corrective actions to be undertaken.

b. The Entry Team quickly assembles needed equipment and assembles at the designated Point of Entry.

c. The Entry Team preplans activities prior to entry into the problem area, and works as quickly as is consistent with safety and time restraints.

d. Perform only those assigned duties intended to control the emergency, but as dictated by the dose rates encountered and the appropriate emergency exposure limits specified in Attachment C.

e. Report progress and/or completion of the assigned work to the Control Room or Technical Support Center by radio or Gaitronics.

IX. ATTACHMENTS

Attachment A, "Protective Equipment"

Attachment B, "Emergency Rescue Equipment"

Attachment C, "Emergency Dose Limits"

ATTACHMENT A

PROTECTIVE EQUIPMENT

ITEM	DESCRIPTION	UNIT	QUANTITY
1.	High range self-reading dosimeter	each	1/member
2.	Personal TLD	each	1/member
3.	Protective clothing as required	each	1/member
4.	Respiratory protection equipment, as required	each	1/member
5.	Portable 2-way radio (if necessary)	each	1/team
6.	First-aid kit (rescue only)	each	1/team

ATTACHMENT B

EMERGENCY RESCUE EQUIPMENT

ITEM	DESCRIPTION	UNIT	QUANTITY
1.	Wrecking bars	each	2
2.	Bolt cutters	each	2
3.	Hacksaw and blades	each	2
4.	Ratchet-type chainfall hoist	each	1
5.	Cable sling, 1/2" x 3'	each	2
6.	Cable sling, 1/2" x 6'	each	2
7.	Hydraulic jack, 1 1/2 ton	each	1
8.	Hydraulic jack, 5 ton	each	1
9.	Sledge hammer, 6#	each	2
10.	Sledge hammer, 12#	each	2
11.	Porta power	each	1
12.	Web slings (2" - 20' long, 2" - 10' long)	each	4
13.	Sound powered phones	pair	1
14.	Safety harness and line	each	1
15.	Fire axe	each	1
16.	Crow bar	each	1
17.	200' - 3 part block and tackle	each	1
18.	Battery lanterns	each	2

ATTACHMENT C

EMERGENCY DOSE LIMITS

	Dose Level	Criteria
1.	5 Rem to the whole body	Dose limit applied to emergency response facility personnel.
2.	25 Rem to the whole body	Dose limit applied to in-plant activities required to correct or mitigate further station degradation.
3.	75 Rem to the whole body	Immediate evaluation and action required for saving of life. When efforts are completed, revert to limits 1 and 2 above, as appropriate.

NOTE: If the limits specified in 2 or 3 are involved, the following considerations should be made:

1. Female employees of child-bearing age should not be allowed to participate;
2. All practical protective measures to limit such an exposure;
3. Concurrence of individual(s) involved (i.e., voluntary risk acceptance);
4. The probability of success should be balanced against the exposure limit;
5. The individual's familiarity with the task to be performed and;
6. The speed with which the individual can perform the task.
7. The amount of radiation the victim has already received.

I. PURPOSE

This procedure describes methodology for the manual determination of airborne radioactive release rates from the Elevated Release Point (reactor building), the turbine building vents, and the augmented radwaste vents, utilizing effluent monitor readings.

II. DISCUSSION

The best method for estimating release rates is through the utilization of count rates (CPM) and flow rates (CFM). Upon determination of release rates, actual or projected plume exposure doses may be calculated in accordance with EPIP 5.7.17 "Dose Assesement." These doses provide a basis for relating plume exposure doses to the EPA Protective Action Guides (PAGs) in accordance with EPIP 5.7.20 "Protective Action Guides".

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev 1

C. NUREG 0747

IV. PREREQUISITES

A. An ALERT or higher level emergency has been declared in accordance with EPIPs 5.7.3, 5.7.4, or 5.7.5.

B. An actual or projected release of radioactive material from the ERP, the turbine building, or the augmented radwaste building has occurred, or has the potential of occurring.

V. LIMITATIONS

None

VI. PRECAUTIONS

A. Determination of ERP release rates using the primary containment monitors (Section E) should be used only if the calculation cannot be performed utilizing the ERP noble gas effluent monitor readings.

The ERP releases can be calculated by correlating the exposure rates on high range radiation monitor in the drywell to which have been calculated assuming a Design Basis Loss of Coolant Accident (LOCA). The LOCA calculations are based on the NUREG-0747 assumptions that

of the maximum full power equilibrium isotopic inventories, 100% of the noble gases, 25% of the halogens, and 1% of the remaining radionuclites are instaneously released to the atmosphere of the primary containment. The leak rate from the primary containment was assumed to be 0.105% volume/day. The secondary containment purge rate was assumed to be 100% volume/day. The entire release is assumed to be through the standby gas system and out the ERP.

B. Dose projections calculated using this procedure should be evaluated utilizing field monitoring data, ERP Radioiodine filter data and other relevant data as it becomes available.

VII. EQUIPMENT

A. Effluent Monitors

B. In Containment High Radiation Area Monitors

VIII. PROCEDURES

A. Procedure for Determination of Release Rate Activity from the Elevated Release Point using ERP effluent monitors. (For ERP Release using containment monitor proceed to section D).

1. Determine the count rate of the release from the ERP monitor. Record this value on Attachment A, column 2.

2. Using the calibration curve for the ERP, determine release in uCi/sec per CFM vs. Count Rate. Record this value on Attachment A, column 3.

3. Determine the ERP flow rate in CFM, record on Attachment A, column 4.

a. If the ERP flow rate monitor or the SBGT flow rate monitor is not operating, estimate the flow rate by obtaining individual fan flow rates.

1) Determine the number of fans operating at 1780 CFM. Multiply the number of fans by 1780 CFM.

2) Obtain the dilution fan flow rate (CFM) if operating.

3) Sum the flow rates (CFM) from the dilution fans and the standby gas treatment fans.

4. Determine the time after shutdown when the release determination is being made, and record on Attachment A, column 1.

5. Using Attachment E and the amount of time since shutdown, determine decimal fraction of radioiodines to release rate of noble gases and record in column 6, Attachment A.

6. Using Attachment F and the amount of time since shutdown, determine decimal fraction of I-131 to total iodines released. Record in column 8, Attachment A.

7. Using math computations on Attachment A, determine release rate of noble gases, total iodines and I-131.

These calculations are as follows:

$$R \times F = RR_{NG}$$

$$R \times F \times C_1 = RR_{TI}$$

$$R \times F \times C_1 \times C_2 = RR_{I\text{-}131}$$

Where:

R = Release in uCi/sec per CFM

F = ERP flow rate in CFM.

C_1 = Decimal of noble gas release which is radioiodines as a function of time after shutdown.

C_2 = Decimal of total radioiodines which is I-131 as a function of time after shutdown.

RR_{NG} = Noble Gas release rate (uCi/sec)

RR_{TI} = Total radioiodine release rate (uCi/sec)

$RR_{I\text{-}131}$ = Iodine-131 release rate (uCi/sec)

B. Determination of Release Rate from the Turbine Building Vent.

1. Determine the Count Rate of the release from the turbine building vents monitor. Record this value on Attachment B, column 2.

2. Using the calibration curve for the turbine building vent monitor, determine release in Ci/sec per CFM. Record this value on Attachment B, column 3.

3. Determine the turbine building vents flow rate in CFM, Attachment B, column 4.

   a. If the turbine building vent flow monitor is not operating, estimate the flow rate by obtaining individual fan flow rates.

1) Determine the number of fans operating. Multiply the number of fans by 50,710 CFM.

4. Determine the time after shutdown when the release determination is being made and record on Attachment B, column 1.

5. Using Attachment E and the amount of time since shutdown, determine decimal fraction of radioiodines to release rate of noble gases and record on column 6, Attachment B.

6. Using Attachment F and the amount of time since shutdown, determine decimal fraction of I-131 to total iodines released. Record on column 8, Attachment B.

7. Using the math computations on Attachment B determine release rate of noble gases, total iodines and I-131.

These calculations are as follows:

$R \times F = RR_{NG}$

$R \times F \times C_1 = RR_{TI}$

$R \times F \times C_1 \times C_2 = RR_{I-131}$

Where:

R = Release in Ci/sec per CFM.

F = Turbine Building vent flow rate in CFM.

C_1 = Decimal of noble gas release which is radioiodines as a function of time after shutdown.

C_2 = Decimal of total radioiodines which is I-131 as a function of time after shutdown.

RR_{NG}=Noble Gas release rate (Ci/sec)

RR_{TI}=Total radioiodine release rate (Ci/sec)

RR_{I-131} = Iodine release rate (Ci/sec)

C. Procedure for Determination of Release Rate Activity From the Augmented Radwaste from vent Monitors.

1. Determine the Count Rate of the release from the Augmented Radwaste vent monitor. Record this value on Attachment C, column 2.

2. Using the calibration curve for the Augmented Radwaste Vent Monitor, determine release in Ci/sec per CFM. Record this value on Attachment C, column 3.

3. Determine the Augmented Radwaste vent flow rate in CFM. Record the value on Attachment C, column 4.

   a. If the Augmented Radwaste vent flow monitor is not operating, estimate the flow rate by obtaining individual fan flow rates.

      1) Determine the number of fans operating. Multiply the number of fans by 16,000 CFM.

4. Determine the time after shutdown when the release determination is being made and record on Attachment C, column 1.

5. Using Attachment E and the amount of time since shutdown, determine decimal fraction of radioiodines to release rate of noble gases and record on column 6, Attachment C.

6. Using Attachment F and the amount of time since shutdown, determine decimal fraction of I-131 to total iodines released. Record on column 8, Attachment C.

7. Using the math computations on Attachment C, determine release rate of noble gases, total iodines, and I-131.

   These calculations are as follows:

   $R \times F = RR_{NG}$

   $R \times F \times C_1 = RR_{TI}$

   $R \times F \times C_1 \times C_2 = RR_{I\text{-}131}$

   Where:

   R = Release in Ci/sec per CFM.

   F = Augmented Building vent flow rate in CFM.

   C_1 = Decimal of noble gas release which is radioiodines as a function of time after shutdown.

   C_2 = Decimal of total radioiodines which is I-131 as a function of time after shutdown.

RR_{NG} = Noble Gas release rate (Ci/sec)

RR_{TI} = Total radioiodine release rate (Ci/sec)

RR_{I-131} = Iodine release rate (Ci/sec)

D. Procedure for Determination of Release Rates Activity From the Elevated release point using the incontainment radiation monitors.

NOTE: This method should be used if the release rates cannot be calculated using the ERP noble gas effluent monitor method in Section A of this procedure.

1. Determine the exposure rates on the high range incontainment radiation monitor. Record this value on Attachment D, column 2, R/hr.

2. Determine time after shutdown release determination is being made. Record on Attachment D, column 1.

3. Determine the DBA-LOCA exposure rate as a function of "effective age" from Attachment G. Record this value on Attachment D, column 3.

4. Determine the DBA-LOCA Noble gas release rate as a function of "effective age" from Attachment H. Record this value on Attachment D, column 4.

5. Using Attachment E (Relative Release Rates of Total Radioiodines to Noble Gases vs. Time), and the amount of time since shutdown, determine decimal fraction of total iodines. Record in column 6, Attachment D.

6. Using Attachment F and the amount of time since shutdown, determine the decimal fraction of I-131 to total iodines released. Record in column 8, Attachment D.

f. Using math computation on Attachment D, determine release rate of noble gases, total iodines, and I-131.

These calculations are as follows:

$$CD/DL \times RR_{NGLOCA} = RR_{NG}$$

$$CD/DL \times RR_{NGLOCA} \times C_1 = RR_{TI}$$

$$CD/DL \times RR_{NGLOCA} \times C_1 \times C_2 = RR_{I-131}$$

Where:

CD = drywell high range radiation monitor reading.

DL = drywell exposure rate at effective age (R/h) from DBA-LOCA.

RR_{NGLoca} = Noble gas release rate at effective age (Ci/sec) from DBA-LOCA.

C_1 = Decimal of noble gas release which is radioiodines as a function of time after core shutdown.

C_2 = Decimal of total radioiodines which is I-131 as a function of time after core shutdown.

RR_{NG}=Noble Gas release rate (Ci/sec)

RR_{TI}=Total radioiodine release rate (Ci/sec)

RR_{I131}=Iodine release rate (Ci/sec)

E. Procedure for Determination of Liquid Release Rate Activity.

1. Use previous inventory concentrations if known, or assume a concentration of 1×10^{-2} µCi/ml during normal operation.

2. If river flow is not known, assume low river flow of 6.8×10^6 gal/min.

3. Calculate downstream concentration by using the formula:

$$\frac{\text{Gal. Disch./Length of Disch. (or Disch. Rate)}}{\text{River Flow - GPM}} = \text{Dilution Factor}$$

Note: $Ft^3/Sec \times 60\ Sec/Min \times 7.48\ Gal/Ft^3 = GPM$

$L/Min \times .264\ Gal/L = GPM$

Dilution Factor x Discharge Concentration µCi/cc = µCi/cc Downstream Concentration.

4. When samples have been collected, update information and relay to the Emergency Director, or if so directed to the State Radiological Health Department.

IX. ATTACHMENTS

Attachment A, "Release Rate Determination, Elevated Release Point Using Effluent Monitors"

Attachment B, "Release Rate Determination, Turbine Building"

Attachment C, "Release Rate Determination, Augmented Radioactive Waste"

Attachment D, "Release Rate Determination, Elevated Release Period using the Primary Containment monitor"

Attachment E, "Relative Release Rates of Radioiodines to Noble Gases vs Time"

Attachment F, "Release Rates of I-131/Total Radioiodine vs. Time Post - LOCA

Attachment G, "Drywell Dose Rate vs. Time"

Attachment H, "Noble Gas Release Rate vs. Time."

"RELEASE RATE DETERMINATION USING ELEVATED RELEASE POINT EFFLUENT MONITOR"

Effective Age (hr) (1)	Release Rate (CPS) (2)	uCi/sec Per CFM (3)		ERP Flow Rate (CFM) (4)		RR(NG) uCi/sec (5)	x	Relative Total Iodine (6)	=	Release Rate RR(TI) uCi/sec (7)	x	Relative Total I-131 (8)	=	RR(I-131) uCi/sec (9)
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	
			x		=		x		=		x		=	

"RELEASE RATE DETERMINATION, TURBINE BUILDING"

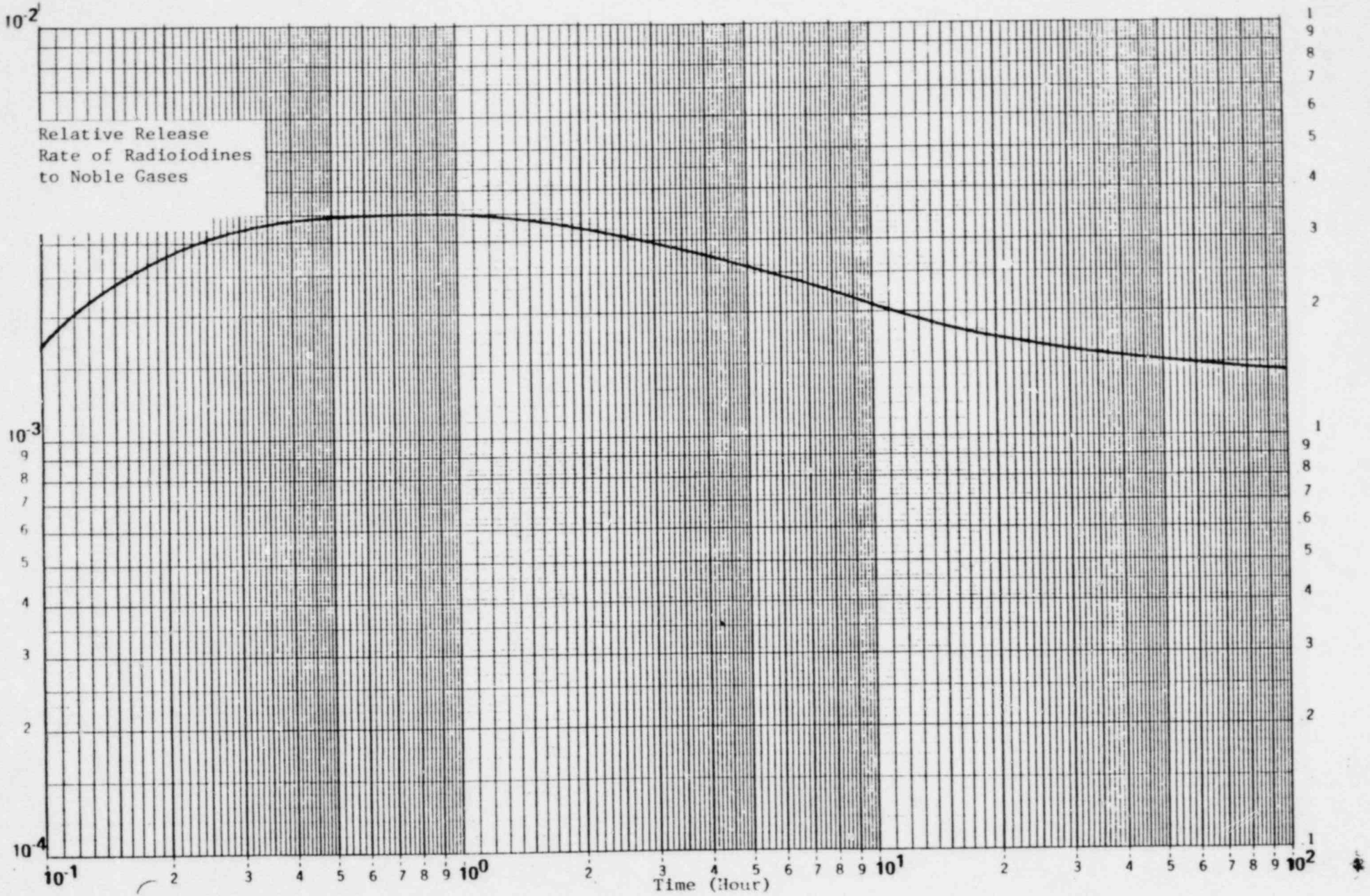
Effective Age (hr) (1)	Count Rate (CPM) (2)	Ci/sec Per CFM (3)		Turbine Bldg. Vent Flow Rate (CFM) (4)		RR(NG) Ci/sec (5)		Relative Total Iodine (6)		Release Rate RR(T1) Ci/sec (7)		Relative Total I-131 (8)		RR(I-131) Ci/sec (9)
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	

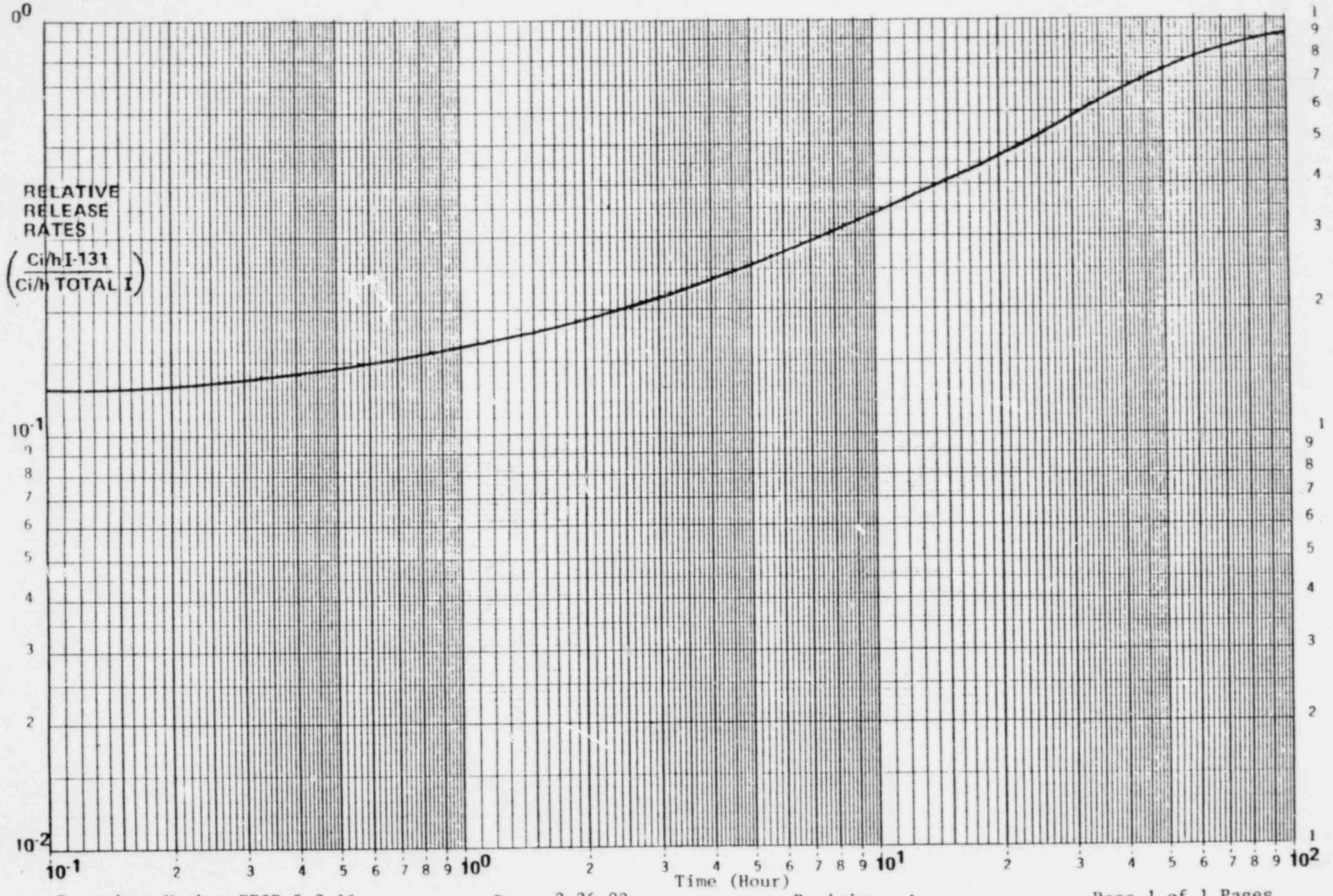
"RELEASE RATE DETERMINATION, AUGMENTED RADIOACTIVE WASTE

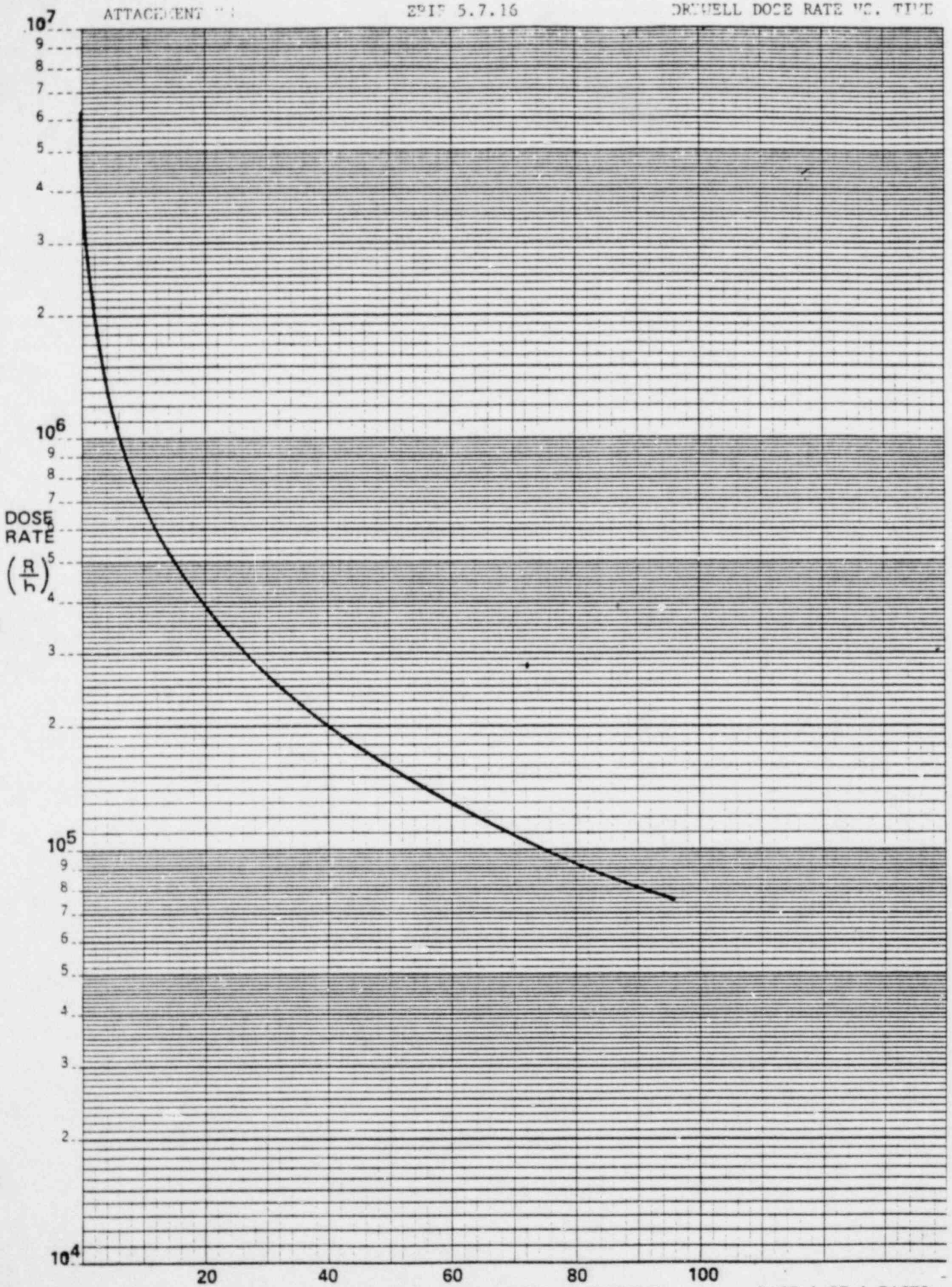
Effective Age (hr) (1)	Count Rate (CPM) (2)	Ci/sec Per CFM (3)		Adg Vent Flow Rate (CFM) (4)		RR(NG) Ci/sec (5)		Relative Total Iodine (6)		Release Rate RR(T1) Ci/sec (7)		Relative Total I-131 (8)		RR(I-131) Ci/sec (9)
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	
			x		=		x	(100)	=		x	(100)	=	

"RELEASE RATE DETERMINATION, ELEVATED RELEASE POINT USING THE PRIMARY CONTAINMENT MONITOR"

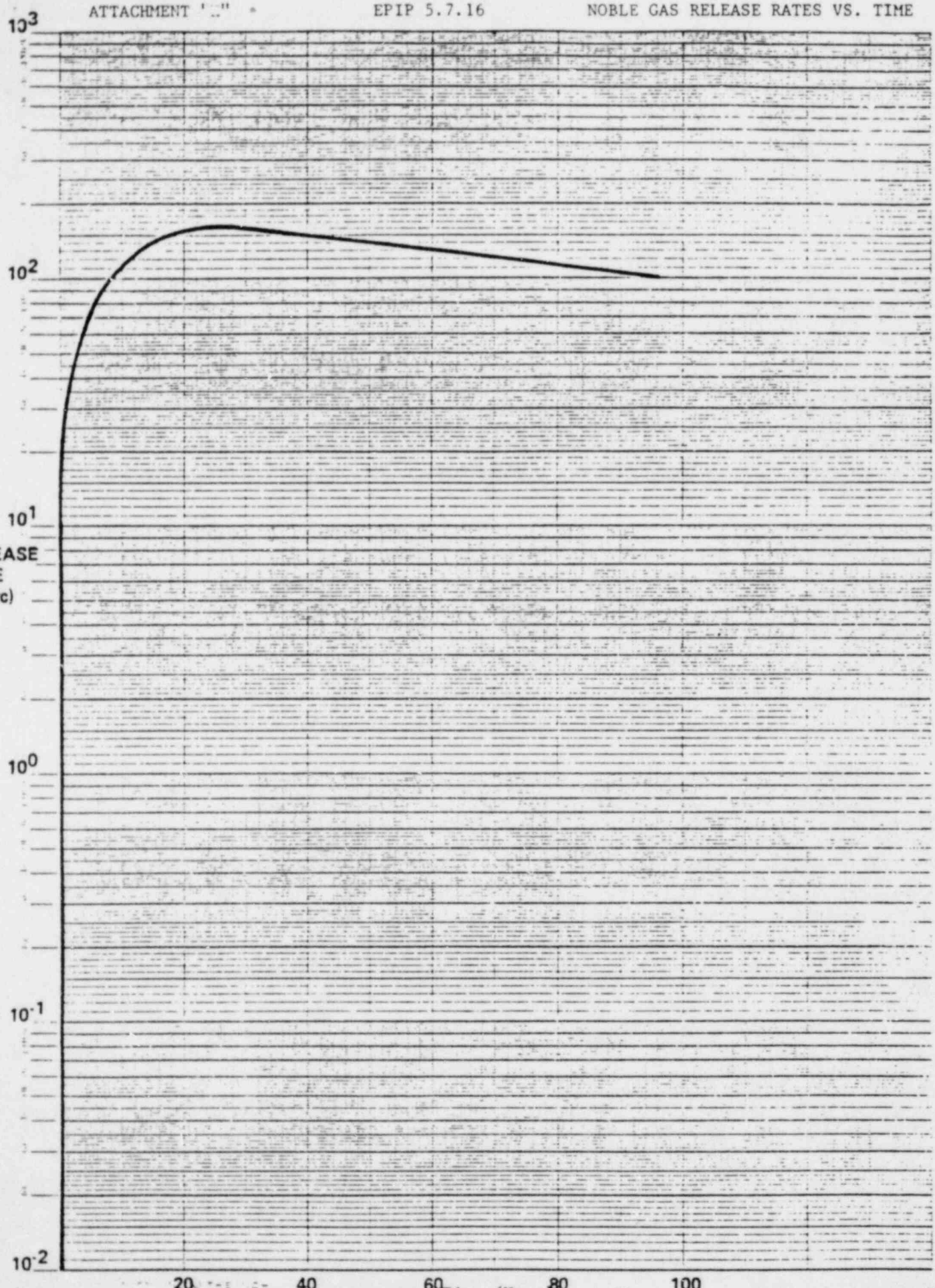
Effective Age (hr) (1)	Actual Containment Exposure Rate (R/hr) (2)		Exposure Rate at effective age (R/hr) (3)		Noble Gas Release Rate (Ci/sec) (4)		RR(NG) (Ci/sec) (5)		Relative Total Iodine (6)		Release Rate RR(TI) (Ci/sec) (7)		Relative Total %I-131 (8)		RR(I-131) (Ci/sec) (9)
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	
		÷		x		=		x		=		x		=	


Relative Release Rate of Radioiodines to Noble Gases
10^{-2}
10^{-3}
10^{-4}
10^{-1}
10^{0}
10^{1}
10^{2}
Time (Hour)


RELATIVE RELEASE RATES
(Ci/h I-131 / Ci/h TOTAL I)
Time (Hour)
10^0
10^-1
10^-2
10^1
10^2


DOSE RATE (R/h)
10^7
9
8
7
6
5
4
3
2
10^6
9
8
7
6
5
4
3
2
10^5
9
8
7
6
5
4
3
2
10^4
20
40
60
80
100

NOBLE GAS RELEASE RATES VS. TIME



I. PURPOSE

To provide an outline of procedures for the proper physical set up of equipment and operating instructions for the computerized NPPD Emergency Preparedness - Atmospheric Dispersion Model - Interim Version.

Should this program become inoperable, a manual backup system will be utilized. Therefore, this procedure also provides instructions and calculations necessary to predict offsite dose rates and integrated doses based upon actual meterological data, release rates, and dispersion factor overlays.

II. DISCUSSION

This procedure is intended to:

A. Ensure the proper physical set up of the appropriate computer terminals in the proper locations.

B. Provide the operators with appropriate instructions in the use of the computer terminals in order to successfully run the Atmospheric Dispersion Model - Interim Version.

C. Provide a manual backup means of adequately addressing dose assessment should the computerized model be inoperable or unavailable.

III. REFERENCE MATERIAL

A. Users Guide for EPM2 - Emergency Preparedness Atmospheric Dispersion Model. Prepared by Dames & Moore.

B. NRC Reg. Guide 1.145, Aug. 1979, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants."

C. NRC Reg. Guide 1.111, July 1977, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases From Light-Water-Cooled Reactors."

D. NRC Reg. Guide 1.109, March 1976, "Calculation of Annual Doses to Man From Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR50, Appendix I".

E. Health Physics Journal, November 1981, "Dose Rate Conversion Factors".

F. ICRP #59, "Working Breathing Rate".

IV. PREREQUISITES

A release of airborne radioactive material has occurred or has the potential of occurring.

V. LIMITATIONS

A Release Rate Determinations must be conducted in accordance with EPIP 5.7.16, "Release Rate Determination."

VI. PRECAUTIONS

A. Actual Dose Rates will vary as a function of:

1. The total curies released (varies with time).

2. Release rate (varies with time).

3. The duration of the release.

4. The isotopic mixture of the release.

5. Meterological conditions.

B. Update and refine dose assessments for critical receptor sites upon significant changes in one or more of the above parameters.

C. Should a release occur which necessitates rapid decision making concerning the recommendation of protective actions, the guidance contained in EPIP 5.7.20 should be followed.

VII. EQUIPMENT

A. Technical Support Center (TSC)

1. Texas Instruments - T.I. 820 Printer, Hard-Copy Terminal.

2. Two (2) RACAL-VADIC-VA3451P MODEMS, 300/1200 Baud.

3. RS-232 DATA SPLITTER.

4. Two (2) standard telephones. At least one (1) must have microwave and outside commercial telephone access.

5. Appropriate wiring harnesses for the proper connection of the terminals and modems.

6. Appropriate amounts of continuous Data Form paper for the hard-copy terminal (Printer).

B. Emergency Operations Facility (EOF)

1. Texas Instruments T.I. 820 Printer, Hard-Copy Terminal.

2. One (1) RACAL-VADIC-VA3451P MODEM, 300/1200 Baud.

3. Two (2) standard telephones. At least one (1) must have microwave and outside commercial telephone access.

4. Appropriate wiring harnesses for the proper connection of the terminal and modem.

5. Appropriate amount of continuous Data Form paper for the hard-copy terminal (Printer).

C. Hand Calculations

1. Environs Map

2. Atmospheric Dispersion Overlays

VIII. PROCEDURE

A. Computerized Dose Assessment

1. Physical set up of equipment.

a. Technical Support Center (TSC)

1) The necessary equipment for the operaton of the Atmospheric Dispersion Model in the TSC is given in Section VII. The T.I. 820 Printer, the two VA-3451P Modems (Marked "A" and "B"), the continuous Data Form paper, and the appropriate wiring harnesses are located in the TSC. Upon arrival in the TSC, make sure the separate pieces of equipment are properly connected to one another in accordance with the configuration shown in Attachment A of this Procedure. Each cable is numbered to correspond with an identically numbered receptacle (i.e., #1 to #1, #2 to #2, etc.).

) It is necessary that the T.I. 820 Printer and the VA-3451P Modems have the proper Terminal Configuration in order to successfully operate the Atmospheric Dispersion Model. This configuration shall be set for the faster 1200 Baud Rate. The configuration of the T.I. 820 Printer has been preset and should not require adjustment. If, however, the Printer is not properly configured, the instruction sheet for the necessary corrections is located on a pullout pad under the front lower left of the machine. For the 1200 Baud mode, the configuration number sequence should read 13, 25, 37. The method for obtaining this sequence of numbers is explained on the pullout pad mentioned above. The normal positions of the two rocker switches on the left side of the keyboard panel should be forward, in the LINE and VIEW position. The on-off switch is located on the back of the machine next to the 115 A.C. power cord should be in the "on" position.

The switch configuration of the VA-3451P MODEMS should be as follows:

Front - Three (3) toggle switches located on the left side of the machine are labeled FA; HS; and DA, VO, MA. The FA switch is a one position switch which will always be in the FA position. The HS switch has two positions and should be in the HS position for normal operation with the 1200 Baud Rate. The lower position, which is not labeled, is for use with the 300 Baud Rate, which will not be used under normal circumstances. The DA. VO, MA switch on the Modems should be in the middle or VO position.

Back - There are two (2) horizontal switches on the back of each Modem. The inside switch (nearest the A.C. power cord) should be in the extreme outside position (away from the A.C. power cord). The outside switch (nearest the outer edge of the modem) is a three-position switch and should be in the middle position for normal use. The proper configuration and explanation of these two switches is attached to the bottom of each modem.

The lighting configuration on the front panel of the VA-3451P Modem is indicative of which mode the VA-3451P Modem happens to be in at the time the light is on. The key to the lighted panel is as follows:

TXD = Transmission of data from the Printer to the Computer - only lights up when a signal is sent to the computer.

RXD = Lit when receiving the data from the Computer to the Printer.

HS = High Speed print rate. 1200 Baud when on/ 300 Baud when off.

CTS = Clear to Send - Meaning the Modem is ready to work.

DSR = Data Set Ready - Meaning the Computer is ready to work.

DTR = Data Terminal Ready - Meaning the Printer is ready to work.

RI = Ring Mode - The Modem is ready to make a telephone call when the light is blinking.

CXR = Carrier Transmit - Signal from the Computer to the Printer is established when lit. This mode will take 2-5 seconds after the first high-pitched tone is received. When the CXR light comes on, the receiver may be hung up.

b. Emergency Operations Facility (EOF)

1) The necessary equipment for operation of the Atmospheric Dispersion Model in the EOF is given in Section VII. This equipment is stored in the CNS Security Building Administration Office. Each piece of equipment must be moved to the designated Radiological Assessment area. The equipment must then be properly connected in accordance with the configuration shown in Attachment A of this Procedure. Each cable is numbered to correspond with an identically numbered receptacle (i.e., #8 to #8, #9 to #9, etc.).

2) The terminal configuration for the T.I. 820 Printer and the VA-3451P MODEMS is the same as those located in the TSC. That configuration is noted above.

2. Operating the Emergency Preparedness Atmospheric Dispersion Model - Interim Version

a. Upon completion of the physcial set up of the T.I. 820 Printer, and appropriate MODEMS in the TSC and EOF as shown in Attachment A, the following steps must be completed.

1) Plug all modules into a common 115 volt A.C. outlet and turn the (OFF, ON) switch to the "ON" position on the T.I. 820 Printers. The VA-3451P MODEMS will automatically activate when the T.I. 820 is turned on.

2) In the TSC, one telephone will be used to access the PRIME Computer in the Columbus General Office. The primary method of communication with the PRIME is the NPPD Microwave Telephone System. The secondary method of communication is a standard commercial telephone line. The numbers to be dialed in order to access the PRIME are as follows:

Primary Method (Microwave) from CNS: 74-368-5285

Secondary Method (Commercial Telephone Line) from CNS: 9-00-563-5285

Allow the telephone to ring until a continuous high pitched tone is received. The continuous high pitched tone indicates that access to the computer has been accomplished. At this time, push the three-position toggle switch on the VA-3451P MODEM "A" from the normal VO position to the DA position. Wait for the CXR indicator light on the front of the Modem to come on (light up). When the CXR light comes on, the communication link from the Computer to the Printer has been established and the telephone receiver should then be gently hung up.

In a normal operating condition, the following lights on the VA-3451P MODEM will be on: HS, CTS, DSR, DTR, and CXR. If one or more of these lights are off, repeat steps (1) and (2).

The second telephone in the TSC will be used to dial-up the Printer in the EOF. The dial-up number for the EOF is CNS extension #207. Extension #207 is a direct hook-up to the VA-3451P MODEM located in the EOF. This is an Auto Answer/Originate Modem which is connected directly to the T.I. 820 Printer in the EOF as shown in Attachment A. Using a second telephone and VA-3451P MODEM "B", the operator in the TSC will dial CNS extension #207 and listen for the high-pitched tone as mentioned in the previous paragraph. Upon receiving the high-pitched tone, push the three-position toggle switch from the VO position to the DA position and wait for the CXR light to come on. Again the activation of this light indicates communication between the Printer in the TSC has been established with the Printer in the EOF.

At this time the equipment in the TSC is operational and the equipment in the EOF is slaved to the TSC equipment.

If the equipment in the TSC malfunctions, the VA-3451P Modem in the EOF will allow a direct communication link with the PRIME by pushing the switch on the Modem to the VO position and dialing the appropriate microwave number mentioned above. When the Computer has been accessed, push the switch to the DA position as noted above.

During normal working hours, contact the Columbus General Office Computer Services Division to clear all other work on the PRIME Computer. Since this program is run on a time share basis, clearing all other work will speed the calculations and enable the program to increase its efficiency. Contact one of the following people.

1. Dennis Smith
   (402) 563-5233

2. Gary Linder
   (402) 563-5350

3. John Riggle
   (402) 563-5680

4. Joe Srb
   (402) 563-5553

3) At this time the Hard-Copy Terminals are operational. In order to test the terminals, the operator in the TSC shall type the word HELLO and then depress the return key. If the words LOGIN PLEASE ER! appear on the Hard-Copy Terminal, the equipment is functioning properly. If nothing is happening on the Printer, repeat steps (1) through (3).

4) Upon proper completion of steps (1) through (3), the following inputs must be entered in order to access the program Model. The computer prompt will indicate the order that inputs must be entered. The Computer Prompts and Operator Inputs are as follows:

Computer Prompt	Operator Input
LOGIN PLEASE ER!	LOGIN EPM1
PROJECT CODE ( ):	CNS
OK,	R EPM3

Notice that the operators' inputs sometimes require spaces between command words. For example: a space must be input between LOGIN and EPM1. Where shown, all blanks are mandatory.

The program will now begin execution.

Give the program a Title - (e.g., Turbine Steamleak).

5) The program will prompt each input that is necessary to properly execute the Model. Attachment B of this procedure contains certain site specific data asked for by the program. This data will be necessary for operator input to successfully complete the Model. With the exception of the Flow Velocity Data, all site parameters will be used as primary information for input to the program. Actual Flow Velocity Data may be obtained from the appropriate meters and charts in the Control Room and the information concerning the Flow Data Velocity in Attachment B will be used as secondary or backup data. This data is based on design flows and may NOT show the actual Flow Velocity. There is a halt after each prompt to allow the operator to input the necessary data. During execution, should the program note that the plume passes over any special receptor or preselected sample points, it will notify the operator who would then refer to Attachment C and appropriate maps for the corresponding grid coordinates and locations.

NOTE: If at any time during the program the telephone link should become disconnected and the program ceases operation, take the following action. ReDial the PRIME Computer and the Program will pick up where it left off when it was disconnected.

NOTE: In the event the terminals located in the TSC should malfunction or the TSC should be evacuated, the TSC operator should NOT Log Out of the program. When the program reaches an appropriate stopping point such as the end of a 15-minute segment, the operator will disconnect (hang up) the terminal from the PRIME Computer. This can be done by pushing the three-position toggle swtiches on both MODEM A and MODEM B to the VO position. At this time the EOF should be notified of the termination of TSC operation of the Dispersion Model. The operator in the EOF can then dial up the PRIME Computer as stated in step (2) above and continue the uninterrupted sequence of 15-minute segments. The EOF then becomes the primary control center for operation of the Atmospheric Dispersion Model.

If the operator wishes to terminate the program, a prompt of "999" will occasionally appear. At this time, the operator must type "999". After typing "999", and thereby terminating the program, the following computer prompts will appear and the appropriate operator inputs must be entered.

Computer Prompt	Operator Input
STOP	
OK,	LO

6) The program has been Logged Out. The operator may either discontinue operations or initiate a new run. If a new run is desired, repeat Step (4) above. If the operator wishes to discontinue the operation of the program, push the three-position toggle switch from the DA position to the VO position.

B. Hand Calculated Dose Assessment

1. The Emergency Director is responsible for the implementation of this procedure.

2. Initiate EPIP 5.7.16, "Release Rate Determination." Obtain the release rate in (Ci/sec) for:

   a. Noble Gases; Record in Column #3, Section A, Attachment I.

   b. I-131; Record in Column #3, Section B, #2, Attachment I.

   c. Recalculate Release Rates as a function of "effective age" and enter in the appropriate columns.

3. Determine the atmospheric stability category.

   a. Using differential temperature recorder determine atmospheric stability category. Visual aid on face of recorder will determine stability. Following step explains stability classification.

      1) Obtain the temperature difference in C° between 97m and 10m, if not available obtain the C° between 47m and 10m, if not available obtain the temperature difference between 97m and 47m. (Read from the upper level to the lower level). Utilizing the

appropriate value, stability categories are defined as follows:

Pasquill Category	Delta Temp C° (97m-10m)	Delta Temp C° (47m-10m)	Delta Temp C° (97m-47m)
A	-1.6	-0.70	-0.95
B	-1.6 to -1.5	-0.70 to -0.63	-0.95 to -0.85
C	-1.5 to -1.3	-0.63 to -0.55	-0.85 to -0.75
D	-1.3 to -0.43	-0.55 to -0.18	-0.75 to -0.25
E	-0.43 to 1.3	-0.18 to 0.55	-0.25 to 0.75
F	1.3 to 3.5	0.55 to 1.48	0.75 to 2.0
G	3.5	1.48	2.0

b. Stability Category determines utilizing meterological data is also discussed in Attachment D.

4. Overlays

a. Select the proper atmospheric dispersion overlay. Overlays are labeled according to the atmospheric stability class. If the release is not from the ERP, utilize dispersion overlay stability category C.

b. Situate the overlay upon the base map. Utilizing the wind direction in compass headings at the 33 ft. height as previously determined, rotate the overlay until the plume centerline is oriented in the direction of the compass heading (compass headings are provided for a full 360° azimuth about the site).

c. Once the dispersion overlay is placed upon the base map, it is clear which receptor locations may be in the path of the dispersing plume. List key receptor site locations in Column #2, Attachment E.

5. Determine X/Q values for key receptor sites.

a. Values on the overlay are $\frac{X\ 10m/s}{Q}$

b. Each receptor site will have a different X10u/Q value.

1) X10u/Q values on the overlay are shown as isopleth lines printed directly upon the overlay. Each isopleth line is labeled with a capital letter to indicate its relative strength. The numerical value corresponding to the letter is shown in the far, lower right corner of the overlay. Plume centerline values are marked by plus marks (+) directly along

the centerline. Each plus mark corresponds to the downwind distance labeling the vertical edges of the figure. The X10u/Q associated with each centerline distance is indicated in the lower right corner of the overlay, directly to the left of the X10u/Q value associated with the isopleth lines (capital letter values). Utilizing these values, it is possible to interpolate X10u/Q values for any area bounded by the outermost isopleth of each overlay. Record the X10u/Q value for each receptor site in Column #3, Attachment E.

2) Estimate the X10u/Q value for each of the receptor site locations. It may be necessary to interpolate between isopleths. Enter this value in Column #3, Attachment E.

3) Obtain the windspeed in m/s at the 97m height. Enter this value in Column #4, Attachment E.

Note: $\frac{\text{MPH}}{2}$ = meters/sec (M/S)

4) Divide Column #3 by Column #4 yielding the resultant X/Q (sec/m^3) value for that receptor site. Record in Column #5.

In equation form the calculation may be represented as:

$$X/Q(sec/m^3) = \frac{X\ 10m/s/Q}{\text{windspeed (m/s) at 97m}}$$

At this point:

Note: A separate worksheet for dose calculations at each key receptor site will be utilized on Attachment E.

6. Calculate the Whole Body Gamma Dose Rates and Integrated doses from noble gas ERP releases as a function of effective age. (Section A, Attachment I).

a. Enter the X/Q value for the receptor site previously determined, in Column #2, Sections A and B as determined from Section 5 above.

b. Determine the gamma decay Energy E as a function of "effective age" of the noble gas at the receptor site utilizing Attachment G. Average gamma decay energy for noble gases as a function of effective age." Enter this value in Column #4, Section A.

1) For most cases the "effective age" of the noble gas at the receptor site may be equal to the "effective age" at the time of the release onset.

2) If the transit time from the release point to the receptor site is greater than one hour the transit time component should be considered. This will result in a more realistic dose estimate. Refer to Attachment F for "effective age" determinations at receptor site involving consideration of transit times.

c. The whole body gamma dose rate is estimated as follows: (Attachment I, Section A)

$$D_{ng}(\text{mrem/hr}) = 9.5 \times 10^{5} \times E\gamma \times R_{ng} \times X/Q$$

Where: D_{ng} = the gamma dose rate at time j at the receptor site of interest (mR/hr) Column #6.

$E\gamma$ = average gamma decay energy (Mev/disintegration) for the isotopic mixture in the cloud, Column #4.

X/Q = the relative concentration at the receptor site (sec/m^3) Column #2.

RR_{ngj} = the noble gas release rate at time j (Ci/sec) or (uCi/sec) Column #3.

9.5×10^{5} = Conversion factor to determine dose rate from air concentration and average decay energy in units of: (Column #5)

$$\frac{\text{mr-disintegration-cc}}{\text{MeV-4Ci-hr}} \quad \text{or} \quad \frac{\text{mr-disintegration-m3}}{\text{MeV-Ci-hr}}$$

Note: 1 uCi/cc = 1 Ci/m^3

d. Calculate the Integrated whole body gamma dose (Attachment I, Section A, Columns 7, 8, 9, 10).

1) Integrated doses at receptor locations may be calculated from the equation:

$$\text{Dose (m/rem)} = \frac{(Dng)1 + (Dng)2}{2} \times (T2 - T1)$$

Where: (Dng)1 = dose rate (mrem/hr) at time 1

(Dng)2 = dose rate (mrem/hr) at time 2

T1 = time 1 (hr)

T2 = time 2 (hr)

2) To obtain the integrated dose (mrem) at time, sum all previous integrated doses.

7. Calculate the inhalation thyroid dose rates and integrated doses for I-131 and all radioiodines as a function of "effective age" for each receptor site utilizing Section B and C, Attachment I.

Note: The major dose contribution to the thyroid for effective ages less than 24 hours is from all radioiodines. Therefore, during the early stages of an emergency this component should be considered. As the effective age of the mixture increases the dose contribution to the thyroid is primarily from I-131. Refer to Attachment H "Ratio of Dose Rates from all radioiodines to ratio of dose rates from I-131."

a. The I-131 thyroid inhalation dose rate is estimated as follows: (Section B, Attachment I)

Note: After determining I-131 dose rate also record on Column 2, Section C, Attachment I.

$$D_{I-131}(rem/hr) = 1.86 \times 10^{6} \times RR_{I-131j} \times X/Q$$

Where:

RR_{I-131j} = the I-131 release rate at time j (Ci/sec) or (uCi/sec) Column #3.

D_{I-131} = the I-131 thyroid inhalation dose rate at the receptor site of interest (rem/hr) Column #5.

1.86×10^{6} = Dose conversion factor for I-131 inhalation by an adult at a "working breathing rate" when the thyroid is the organ of interest.

($Rem\text{-}m^3/hr\text{-}Ci$ or Rem-cc/hr-uCi).

X/Q = the relative concentration at the receptor site (sec/m^3) Column #2.

b. Calculate the thyroid inhalation dose rate from all radioiodines Section C, Attachment I.

1) Determine the ratio of dose rates from total radioiodines/I-131 as a function of "effective age" from Figure #2, and record in Column 3, Section C.

2) The thyroid inhalation dose rate from all radioiodines is estimated as follows:

$$D_{\text{total I's}}(\text{rem/hr}) = D_{\text{I-131}}(\text{rem/hr}) \times \frac{\text{total radioiodine dose rate}}{\text{I-131 dose rate}}$$

Where:

$D_{\text{total I's}}(\text{rem/hr})$ = the thyroid inhalation dose rate from all radioiodines at the receptor site of interest (rem/hr).

$D_{\text{I-131}}(\text{rem/hr})$ = the I-131 thyroid inhalation dose rate.

$\frac{\text{Total radioiodine dose rate (rem/hr)}}{\text{I-131 dose rate (rem/hr)}}$ = ratio of dose rates from Attachment H

c. Calculate the integrated thyroid inhalation dose from I-131 and total radioiodines in accordance with 6.d.(1) utilizing Sections B and C of Attachment I.

d. Calculate child dose rates and integrated doses from I-131 and total radioiodines.

1) For young children the thyroid dose would be approximately double that of the adult for inhalation of identical atmospheres. Increased child doses are a function of:

a) Thyroid size and mass.

b) Increased breathing rates for children.

c) Increased thyroid activity in children resulting in an increased uptake.

2) To determine the child radioiodine inhalation dose rates and integrated doses from I-131 and total radioiodines, simply double the total for adult.

8. Update and refine dose assessments for critical receptor sites upon significant changes in releases or meteorological conditions.

IX. ATTACHMENTS

Attachment A, "Flow Diagram of Terminal Hookup Configuration at the CNS Technical Support Center, Emergency Operation Facility, and the Columbus General Office"

Attachment B, "Input Information for the EPM2 Atmospheric Dispersion Model - Interim Version"

Attachment C, "Identification and Location of Special Receptors and Preselected Sampling Points"

Attachment D, "Stability Category Determination"

Attachment E, "Key Receptor Site, X/Q Determination"

Attachment F, "Determination of Transit Times and Effective Age of Noble Gases at Receptor Sites of Interest

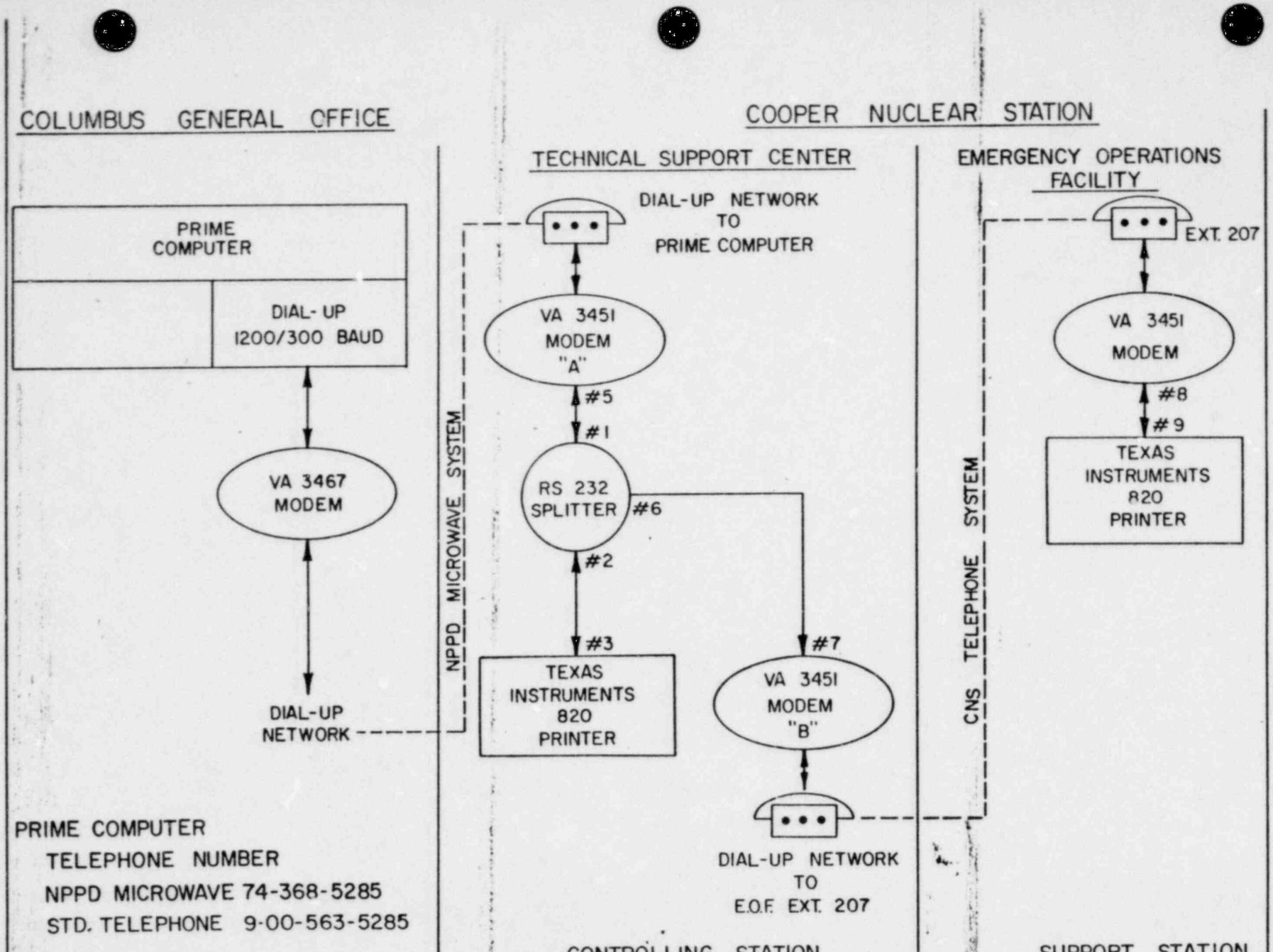
Attachment G, "Average Gamma Decay Energy for Noble Gases as a Function of Effective Age"

Attachment H, "Ratio of Dose Rates from all Radioiodines to Ratio of Dose Rates from I-131

Attachment I, "Calculation of Dose Rates and Integrated Dose for Whole Body and Thyroid"

Attachment J, "Average Gamma Decay Energy"

ATTACHMENT "A" EPIP 5.7.17 TERMINAL HOOKUP CONFIGURATION



ATTACHMENT B

INPUT INFORMATION FOR EPM2 ATMOSPHERIC
DISPERSION MODEL - INTERIM VERSION

PARAMETER	REACTOR BUILDING	T-G BUILDING FAN EXHAUST BUILDING	RADWASTE BUILDING		AUGMENTED RADWASTE BUILDING	ELEVATED RELEASE POINT
Number of Ducts	1	1	DUAL	SINGLE	1	1
Duct Coordinates (from ERP)	75'W,492'N	100'E,396'N	267'W,583'N	230'W,583'N	342'W,525'N	0,0
Model Coordinate Input	-75,492	100,396	-267,583	-230,583	-342,525	0,0
Effluent Release Height (meters above grade)	49.1	10.1	16.5	16.5	13.5	99.4
Height of Tallest Adjacent Building (meters above grade)	44.5	44.5	44.5	44.5	44.5	44.5
Flow Velocity(e) (meters/second)	11.66	8.05(a)	6.45	8.16	15.67	14.42(b) 8.56(c) 22.98(d)
Flow Rate (cfm)	73405	50710(a)	40570	10030	16500	3000(b) 1780(c) 4780(d)
Release Vent (meters)	1.95	1.95(a)	1.95	0.86	0.80	0.35
Diameter (feet)	6.38	6.38(a)	6.38	2.82	2.61	1.16
Exhaust Temp (°F) Winter	70	70	70	70	70	60
Exhaust Temp (°F) Summer	90	90	90	90	90	90
Structure Elevation (feet MSL)	RxBldg 1049' Ex Fan 1064'	TGB 1010' Fan Bldg 933'	Bldg 952' Ex Fan 957'	Bldg 952' Ex Fan 957'	Bldg 941' Ex Fan 941'	1228'
Grade Level (feet MSL)	903'	903'	903'	903'	903'	903'

(a) Data given for Turbine-Generator exhaust fans is for one operating fan. Multiply data by total number of fans in operation. There are a total of four (4) fans. Typically three fans are in continuous operation with one standby.

(b) Elevated Release Point Dilution Fan Only.

(c) Standby Gas Treatment Fans Only.

(d) Elevated Release Point Dilution Fan and Standby Gas Treatment System Fans. This is the normal operating situation when the Standby Gas Treatment System is in operation.

(e) Design basis only - These numbers are to be used as backup information only. When possible use actual meter or chart readings.

ATTACHMENT C

IDENTIFICATION AND LOCATION OF SPECIAL
RECEPTORS AND PRESELECTED SAMPLING POINTS

Identification	Polar Bearing (Degrees)	Cartesian Grid Coordinants Y	X	Distance (Miles)	Special Receptor Points	Preselected Sampling & Monitoring Points	Built-In EPM 2 Polar Grid Receptor Points	Comparison Points
A-1	11.25	1.96	0.39	2	X			
A-2	354.38	3.48	-0.34	3.5	X			
A-3	5.63	3.48	0.34	3.5	X			
A-4	11.25	3.92	0.78	4	X			
A-5	11.25	5.88	1.17	6	X	X		
A-6	354.38	6.97	-0.69	7	X			
A-7	5.63	6.97	0.69	7	X			
A-8	0.00	8.00	0.00	8	X	X		
A-9	11.25	8.83	1.76	9	X			
A-10	354.38	9.95	-0.98	10	X			
A-11	5.63	9.95	0.98	10	X	X		
A-12	0.00	2.75	0.00	2.75		X		X
A-13	0.00	5.00	0.00	5		X		X
A-14 (Watson, MO)	5.63	8.21	0.81	8.25	X	X		
A-15 (Hamburg, IA)	356.5	16.77	-1.03	16.8	X			
B-1	33.75	1.66	1.11	2	X			
B-2	28.13	3.09	1.65	3.5	X	X		
B-3	16.88	3.35	1.02	3.5	X			
B-4	33.75	3.33	2.22	4	X			
B-5	33.75	4.99	3.33	6	X			

ATTACHMENT C

IDENTIFICATION AND LOCATION OF SPECIAL
RECEPTORS AND PRESELECTED SAMPLING POINTS

Identification	Polar Bearing (Degrees)	Cartesian Grid Coordinants Y	Cartesian Grid Coordinants X	Distance (Miles)	Special Receptor Points	Preselected Sampling & Monitoring Points	Built-In EPM 2 Polar Grid Receptor Points	Comparison Points
(Cont'd)								
B-6	16.88	6.70	2.03	7	X			
B-7	28.13	6.17	3.30	7	X			
B-8	22.50	7.39	3.06	8	X			
B-9	33.75	7.48	5.00	9	X			
B-10	16.88	9.57	2.90	10	X	X		
B-11	28.13	8.82	4.71	10	X			
B-12	22.50	2.31	0.96	2.5		X	X	
B-13	20.50	6.56	2.45	7		X		X
B-14 (Shenandoah, IA)	27.00	3.43	27.00	31.00	X			
C-1	56.25	1.11	1.66	2	X			
C-2 (Phelps City, MO)	39.38	2.71	2.22	3.5	X	X		
C-3	50.63	2.22	2.71	3.5	X			
C-4	56.25	2.22	3.33	4	X			
C-5	56.25	3.33	4.99	6	X			
C-6	39.38	5.41	4.44	7	X			
C-7	50.63	4.44	5.41	7	X	X		
C-8	45.00	5.66	5.66	8	X			
C-9	56.25	5.00	7.48	9	X			
C-10	39.38	7.73	6.34	10	X			
C-11	50.63	6.34	7.73	10	X	X		
C-12	45.00	1.94	1.94	2.75		X		X

ATTACHMENT C

IDENTIFICATION AND LOCATION OF SPECIAL
RECEPTORS AND PRESELECTED SAMPLING POINTS

Identification	Polar Bearing (Degrees)	Cartesian Grid Coordinants Y	X	Distance (Miles)	Special Receptor Points	Preselected Sampling & Monitoring Points	Built-In EPM 2 Polar Grid Receptor Points	Comparison Points
D-1	78.75	0.39	1.96	2	X	X		
D-2	61.88	1.65	3.09	3.5	X			
D-3	73.13	1.02	3.35	3.5	X			
D-4	78.75	0.78	3.92	4	X			
D-5	78.75	1.17	5.88	6	X			
D-6	61.88	3.30	6.17	7	X	X		
D-7	73.13	2.03	6.70	7	X	X		
D-8	67.50	3.06	7.39	8	X			
D-9	78.75	1.76	8.83	9	X			
D-10	61.88	4.71	8.82	10	X			
D-11	73.13	2.90	9.57	10	X	X		
D-12	67.50	1.82	4.39	4.75		X		X
D-13 (Tarkio, MO)	68.00	0.75	1.85	14.8	X			
E-1	101.25	-0.39	1.96	2	X	X		
E-2	84.38	0.34	3.48	3.5	X			
E-3 (Langdon, MO)	95.63	-0.34	3.48	3.5	X	X		
E-4	101.25	-0.78	3.92	4	X			
E-5	101.25	-1.17	5.88	6	X			
E-6	84.38	0.69	6.97	7	X	X		
E-7	95.63	-0.69	6.97	7	X			

ATTACHMENT C

IDENTIFICATION AND LOCATION OF SPECIAL
RECEPTORS AND PRESELECTED SAMPLING POINTS

Identification	Polar Bearing (Degrees)	Cartesian Grid Coordinants Y	Cartesian Grid Coordinants X	Distance (Miles)	Special Receptor Points	Preselected Sampling & Monitoring Points	Built-In EPM 2 Polar Grid Receptor Points	Comparison Points
(Cont'd)								
E-8	90.00	0.00	8.00	8	X			
E-9	101.25	-1.76	8.83	9	X			
E-10	84.38	0.98	9.95	10	X	X		
E-11	95.63	-0.98	9.95	10	X			
E-12 (Fairfax, MO)	97.00	-1.49	12.11	12.2	X			
F-1	123.75	-1.11	1.66	2	X			
F-2	106.88	-1.02	3.35	3.5	X			
F-3	118.13	-1.65	3.09	3.5	X			
F-4	123.75	-2.25	3.33	4	X			
F-5	123.75	-3.33	4.99	6	X			
F-6	106.88	-2.03	6.70	7	X			
F-7	118.13	-3.30	6.17	7	X			
F-8	112.50	-3.06	7.39	8	X			
F-9	123.75	-5.00	7.48	9	X			
F-10	106.88	-2.90	9.57	10	X	X		
F-11	118.13	-4.71	8.82	10	X			
F-12	106.88	-0.73	2.39	2.5		X		X
F-13	112.50	-1.91	4.62	5		X	X	
F-14	112.50	-2.68	6.47	7		X		

ATTACHMENT C

IDENTIFICATION AND LOCATION OF SPECIAL
RECEPTORS AND PRESELECTED SAMPLING POINTS

Identification	Polar Bearing (Degrees)	Cartesian Grid Coordinants Y	X	Distance (Miles)	Special Receptor Points	Preselected Sampling & Monitoring Points	Built-In EPM 2 Polar Grid Receptor Points	Comparison Points
G-1	146.25	-1.66	1.11	2	X			
G-2	129.38	-2.22	2.71	3.5	X			
G-3	140.63	-2.71	2.22	3.5	X			
G-4	146.25	-3.33	2.22	4	X			
G-5	146.25	-4.99	3.33	6	X			
G-6	129.38	-4.44	5.41	7	X			
G-7	140.63	-5.41	4.44	7	X			
G-8	135.00	-5.66	5.66	8	X	X		
G-9	146.25	-7.48	5.00	9	X			
G-10	129.38	-6.34	7.73	10	X			
G-11	140.63	-7.73	6.34	10	X			
G-12	135.00	-1.77	1.77	2.5		X	X	
G-13	146.25	-4.81	1.36	5		X		X
G-14	124.00	-2.80	4.15	5		X		X
G-15	135.00	-6.54	6.54	9.25		X		X
G-16 (Corning, MO)	129.00	-8.02	9.91	12.75	X			
G-17 (Craig, MO)	130.50	-12.01	14.07	18.50	X			
H-1	168.75	-1.96	0.39	2	X			
H-2	151.88	-3.09	1.65	3.5	X			
H-3	163.13	-3.35	1.02	3.5	X	X		
H-4	168.75	-3.92	0.78	4	X			

ATTACHMENT C

IDENTIFICATION AND LOCATION OF SPECIAL
RECEPTORS AND PRESELECTED SAMPLING POINTS

Identification	Polar Bearing (Degrees)	Cartesian Grid Coordinants Y	X	Distance (Miles)	Special Receptor Points	Preselected Sampling & Monitoring Points	Built-In EPM 2 Polar Grid Receptor Points	Comparison Points
(Cont'd)								
H-5	168.75	-5.88	1.17	6	X			
H-6	151.88	-6.17	3.30	7	X			
H-7	163.13	-6.70	2.03	7	X			
H-8	157.50	-7.39	3.06	8	X			
H-9	168.75	-8.83	1.76	9	X			
H-10	151.88	-8.82	4.71	10	X			
H-11	163.13	-9.57	2.90	10	X			
H-12	157.5	-5.08	2.10	5.5		X	X	
H-13	160.0	-7.05	2.57	7.5		X		X
H-14 (Indian Cave, Ranger Station)	152.0	-6.71	3.57	7.6		X		X
H-15 (Barada, NE)	161.0	-10.16	3.50	10.75	X	X		
H-16 (Rulo, NE)	151.5	-18.72	10.16	21.3	X			
J-1	191.25	-1.96	-0.39	2	X			
J-2	174.38	-3.48	0.34	3.5	X			
J-3	185.63	-3.48	-0.34	3.5	X			
J-4	191.25	-3.92	-0.78	4	X			
J-5	191.25	-5.88	-1.17	6	X			
J-6	174.38	-6.97	0.69	7	X	X		
J-7	185.63	-6.97	-0.69	7	X	X		

ATTACHMENT C

IDENTIFICATION AND LOCATION OF SPECIAL
RECEPTORS AND PRESELECTED SAMPLING POINTS

Identification	Polar Bearing (Degrees)	Cartesian Grid Coordinants Y	X	Distance (Miles)	Special Receptor Points	Preselected Sampling & Monitoring Points	Built-In EPM 2 Polar Grid Receptor Points	Comparison Points
(Cont'd)								
J-8	180.00	-8.00	0.00	8	X			
J-9	Replace with K.11.a							
J-10	174.38	-9.95	0.98	10	X			
J-11	185.63	-9.95	-0.98	10	X			
J-12	180.00	-1.00	0.00	1		X		X
J-13	187.00	-4.96	-0.61	5		X		X
J-14	178.00	-8.99	0.31	9		X		X
J-15 (Falls City, NE)	172.50	-21.12	2.78	21.3	X			
J-16 (Hiawatha, KS)	171.00	-35.56	5.63	36.0	X			
K-1	213.75	-1.66	-1.11	2	X	X		
K-2	196.88	-3.35	-1.02	3.5	X			
K-3	208.13	-3.09	-1.65	3.5	X	X		
K-4	213.75	-3.33	-2.22	4	X			
K-5	213.75	-4.99	-3.33	6	X			
K-6	196.88	-6.70	-2.03	7	X			
K-7	208.13	-6.17	-3.30	7	X			
K-8	202.50	-7.39	-3.06	8	X			
K-9	213.75	-7.48	-5.00	9	X			
K-10	196.88	-9.57	-2.90	10	X			
K-11	208.13	-8.82	-4.71	10	X			

ATTACHMENT C

IDENTIFICATION AND LOCATION OF SPECIAL
RECEPTORS AND PRESELECTED SAMPLING POINTS

Identification	Polar Bearing (Degrees)	Cartesian Grid Coordinants Y	X	Distance (Miles)	Special Receptor Points	Preselected Sampling & Monitoring Points	Built-In EPM 2 Polar Grid Receptor Points	Comparison Points
(Cont'd)								
K-11.a (Shubert)	194.00	-8.98	-2.24	9.25	X	X		
K-12	196.00	-4.81	-1.38	5		X		X
K-13	200.00	-6.58	-2.39	7		X		X
K-14 (Verdon, NE)	195.5	-15.13	-4.20	15.7	X			
K-15 (Dawson, NE)	212.5	-16.24	-10.34	19.25	X			
K-16 (Salem, NE)	194.00	-20.28	-5.06	20.9	X			
K-17 (Sebetha, KS)	196.50	-35.76	-10.59	37.3	X			
L-1	236.25	-1.11	-1.66	2	X			
L-2	219.38	-2.71	-2.22	3.5	X			
L-3	230.63	-2.22	-2.71	3.5	X			
L-4	236.25	-2.22	-3.33	4	X			
L-5	236.25	-3.33	-4.99	6	X			
L-6	219.38	-5.41	-4.44	7	X			
L-7	230.63	-4.44	-5.41	7	X			
L-8	225.00	-5.66	-5.66	8	X	X		
L-9	236.25	-5.00	-7.48	9	X			
L-10	219.38	-7.73	-6.34	10	X			
L-11	230.63	-6.34	-7.73	10	X			
L-12 (Nemaha, NE)	225.00	-1.77	-1.77	2.5		X	X	
L-13	225.00	-3.54	-3.54	5		X	X	

ATTACHMENT C

IDENTIFICATION AND LOCATION OF SPECIAL
RECEPTORS AND PRESELECTED SAMPLING POINTS

Identification	Polar Bearing (Degrees)	Cartesian Grid Coordinants Y	Cartesian Grid Coordinants X	Distance (Miles)	Special Receptor Points	Preselected Sampling & Monitoring Points	Built-In EPM 2 Polar Grid Receptor Points	Comparison Points
(Cont'd)								
L-14 (Stella, NE)	216.50	-9.45	-6.99	11.75	X	X		
L-15 (Humboldt, NE)	230.00	-13.88	-16.55	21.60	X			
M-1	258.75	-0.39	-1.96	2	X			
M-2	241.88	-1.65	-3.09	3.5	X			
M-3	253.13	-1.02	-3.35	3.5	X	X		
M-4	258.75	-0.78	-3.92	4	X			
M-5	258.75	-1.17	-5.88	6	X			
M-6	241.88	-3.30	-6.17	7	X	X		
M-7	253.13	-2.03	-6.70	7	X			
M-8	247.50	-3.06	-7.39	8	X			
M-9	258.75	-1.76	-8.83	9	X			
M-10	241.88	-4.71	-8.82	10	X			
M-11	253.13	-2.90	-9.57	10	X	X		
M-12	247.50	-0.29	-0.69	0.75		X	X	
M-13	247.50	-0.96	-2.31	2.5		X	X	
M-14	247.50	-1.91	-4.62	5		X	X	

ATTACHMENT C

IDENTIFICATION AND LOCATION OF SPECIAL
RECEPTORS AND PRESELECTED SAMPLING POINTS

Identification	Polar Bearing (Degrees)	Cartesian Grid Coordinants Y	X	Distance (Miles)	Special Receptor Points	Preselected Sampling & Monitoring Points	Built-In EPM 2 Polar Grid Receptor Points	Comparison Points
N-1	281.25	0.39	-1.96	2	X			
N-2	264.38	-0.34	-3.48	3.5	X			
N-3	275.63	0.34	-3.48	3.5	X			
N-4	281.25	0.78	-3.92	4	X			
N-5	281.25	1.17	-5.88	6	X			
N-6	264.38	-0.69	-6.97	7	X			
N-	275.63	0.69	-6.97	7	X			
N-8	270.00	0.00	-8.00	8	X			
N-9	281.25	1.76	-8.83	9	X			
N-10	264.38	-0.98	-9.95	10	X	X		
N-11	275.63	0.98	-9.95	10	X	X		
N-12	270.00	0.00	-1.50	1.5		X	X	
N-13	270.00	0.00	-5.00	5		X	X	
N-14	278.50	1.03	-6.92	7		X		X
N-15 (Auburn, NE)	281.25	2.10	-10.54	10.75	X	X		
N-16 (Johnson, NE)	280.25	3.47	-19.19	19.50	X			
N-17 (Elk Creek, NE)	258.75	-5.22	-26.24	26.75	X			
N-18 (Tecumseh, NE)	271.00	0.52	-29.60	29.60	X			
P-1	303.75	1.11	-1.66	2	X	X		
P-2	286.88	1.02	-3.35	3.5	X			
P-3	298.13	1.65	-3.09	3.5	X			

ATTACHMENT C

IDENTIFICATION AND LOCATION OF SPECIAL
RECEPTORS AND PRESELECTED SAMPLING POINTS

Identification	Polar Bearing (Degrees)	Cartesian Grid Coordinants Y	Cartesian Grid Coordinants X	Distance (Miles)	Special Receptor Points	Preselected Sampling & Monitoring Points	Built-In EPM 2 Polar Grid Receptor Points	Comparison Points
(Cont'd)								
P-4	303.75	2.22	-3.33	4	X	X		
P-5	303.75	3.33	-4.99	6	X			
P-6	286.88	2.03	-6.70	7	X	X		
P-7	298.13	3.30	-6.17	7	X			
P-8	292.50	3.06	-7.39	8	X			
P-9	303.75	5.00	-7.48	9	X	X		
P-10	286.88	2.90	-9.57	10	X	X		
P-11	298.13	4.71	-8.82	10	X			
P-12	294.00	1.02	-2.28	2.5		X		X
P-13	293.00	1.95	-4.60	5		X		X
P-14 (Brock, NE)	296.50	8.48	-17.00	19.0	X			
Q-1	326.25	1.66	-1.11	2	X			
Q-2	309.38	2.22	-2.71	3.5	X			
Q-3	320.63	2.71	-2.22	3.5	X			
Q-4	326.25	3.33	-2.22	4	X			
Q-5	326.25	4.99	-3.33	6	X			
Q-6	309.38	4.44	-5.41	7	X	X		
Q-7	320.63	5.41	-4.44	7	X			
Q-8	315.00	5.66	-5.66	8	X			
Q-9	326.25	7.48	-5.00	9	X			

ATTACHMENT C

IDENTIFICATION AND LOCATION OF SPECIAL
RECEPTORS AND PRESELECTED SAMPLING POINTS

Identification	Polar Bearing (Degrees)	Cartesian Grid Coordinants Y	X	Distance (Miles)	Special Receptor Points	Preselected Sampling & Monitoring Points	Built-In EPM 2 Polar Grid Receptor Points	Comparison Points
(Cont'd)								
Q-10	309.38	6.34	-7.73	10	X			
Q-11	320.63	7.73	-6.34	10	X			
Q-12	315.00	0.53	-0.53	0.75		X	X	
Q-13	315.00	1.77	-1.77	2.5		X	X	
Q-14	317.50	3.69	-3.38	5		X		X
Q-15	317.50	6.64	-6.08	9		X		X
Q-16 (Julian, NE)	314.00	11.25	-11.65	16.2	X			
R-1	348.75	1.96	-0.39	2	X	X		
R-2	331.88	3.09	-1.65	3.5	X	X		
R-3	343.13	3.35	-1.02	3.5	X			
R-4	348.75	3.92	-0.78	4	X			
R-5	348.75	5.88	-1.77	6	X			
R-6	331.88	6.17	-3.30	7	X	X		
R-7	343.13	6.70	-2.03	7	X			
R-8	337.50	7.39	-3.06	8	X			
R-9	348.75	8.83	-1.76	9	X			
R-10	331.88	8.82	-4.71	10	X	X		
R-11	343.13	9.57	-2.90	10	X			
R-12	337.50	1.39	-0.57	1.5		X	X	
R-13 (Brownville, NE)	337.50	2.31	-0.96	2.5		X	X	
R-14 (Nebraska City, NE)	334.00	22.02	-10.74	24.5	X			

ATTACHMENT D

STABILITY CATEGORY DETERMINATION
Utilizing Data Obtained From
Meterological Tower

Methods Are Listed in Order of Preference

1. Obtain the temperature difference in C° between 100m and 10m, if not available obtain the Delta C° between 100m and 60m, if not available obtain the delta C° between 60m and 10m. Utilizing the appropriate value, stability categories are defined as follows:

Pasquill Category	Delta Temp C° (100m-10m) *1	Delta Temp C° (100m-60m) *2	Delta Temp C° (60m-10m)
A	-1.7	-0.76	-0.95
B	-1.7 to -1.5	-0.76 to -0.68	-0.95 to -0.85
C	-1.5 to -1.3	-0.68 to -0.60	-0.85 to -0.75
D	-1.3 to -0.45	-0.60 to -0.20	-0.75 to -0.25
E	-0.45 to 1.3	-0.20 to 0.52	-0.25 to 0.75
F	1.3 to 3.6	0.52 to 1.6	0.75 to 2.0
G	3.6	1.6	2.0

2. Obtain sigma at 100 meters for windspeeds above the threshold value. If not available obtain sigma at 10 meters. Utilizing the appropriate value, stability categories are defined as follows:

Stability Category	Stnd Deviation at 100m	Stnd Deviation at 60m	Stnd Deviation at 10m
A			25
B			20
C			15
D			10
E			5
F			2.5
G			1.7

3. If none of the above data is available from the new meterological tower, utilize data from the ERP tower.

4. If data is not available from either meterological tower utilize data obtained through visual observation.

KEY TO STABILITY CATEGORIES

Surface Wind _____ Day _____ Night _____

Speed (at 33 ft) (m/sec)	Incoming Solar Radiation			Thinly Overcast	
	Strong	Moderate	Slight	Greater Than 4/8 Cloud	Less Than 3/8 Cloud
2	A	A-B	B		
2-3	A-B	B	C	E	F
3-5	B	B-C	C	D	E
5-6	C	C-D	D	D	D
6	C	D	D	D	D

Note: The neutral class, D, should be assumed for overcast conditions during day or night.

- Sampling time of ten minutes
- Night refers to the period from 1 hour before sunset to 1 hour after sunrise.
- Class D may be assumed for overcast condition during day or night, regardless of wind speed.
- "Strong" incoming solar radiation; solar altitude greater than 60° with clear skies.
- "Slight" incoming solar radiation; solar altitude from 15° to 35° with clear skies.

ATTACHMENT E

KEY RECEPTOR SITE, X/Q DETERMINATION

Effective Age (hr)	Receptor Site	X10u/Q (m/s)	Windspeed at 97m m/s	X/Q (Sec/m3)

ATTACHMENT F

DETERMINATION OF TRANSIT TIMES AND "EFFECTIVE AGE" OF NOBLE GASES AT RECEPTOR SITES OF INTEREST

A. "Effective Age" is defined as time elapsed (hr) since the core power generation was halted; Worksheet "Appendix F" is provided for effective age determination. For offsite locations, the "effective age" of the isotopic mixture may be obtained through summarizing the following components:

1. The "effective age" at the time of release onset.

2. The transit time from the release point to the receptor site (refer to Section B).

B. Calculation of Transit Time from the release point to the receptor location.

1. Estimate the downwind distance (meters) to the receptor location. If necessary, utilize a conversion factor of 1609 meters/mile.

2. Divide the distance in meters by the 10 meter level wind speed (m/s).

3. Divide this value by 3600 sec/hr. yielding transit time (hr) from the release point to the receptor site.

In equation form, the calculation may be represented as:

$$\text{Transit Time(hr)} = \frac{\text{Distance from release point to the receptor site (mile)} \times 1609 \text{(meters/mi)}}{\text{wind speed at 10m (m/sec)} \times 3600 \text{ (sec/hr)}}$$

4. In equation form:

"Effective Age" of the isotopic mixture at the receptor location (hr) = "Effective Age" of the mixture at the time of the release onset (hr) + Transit Time from the release point to the receptor location (hr)

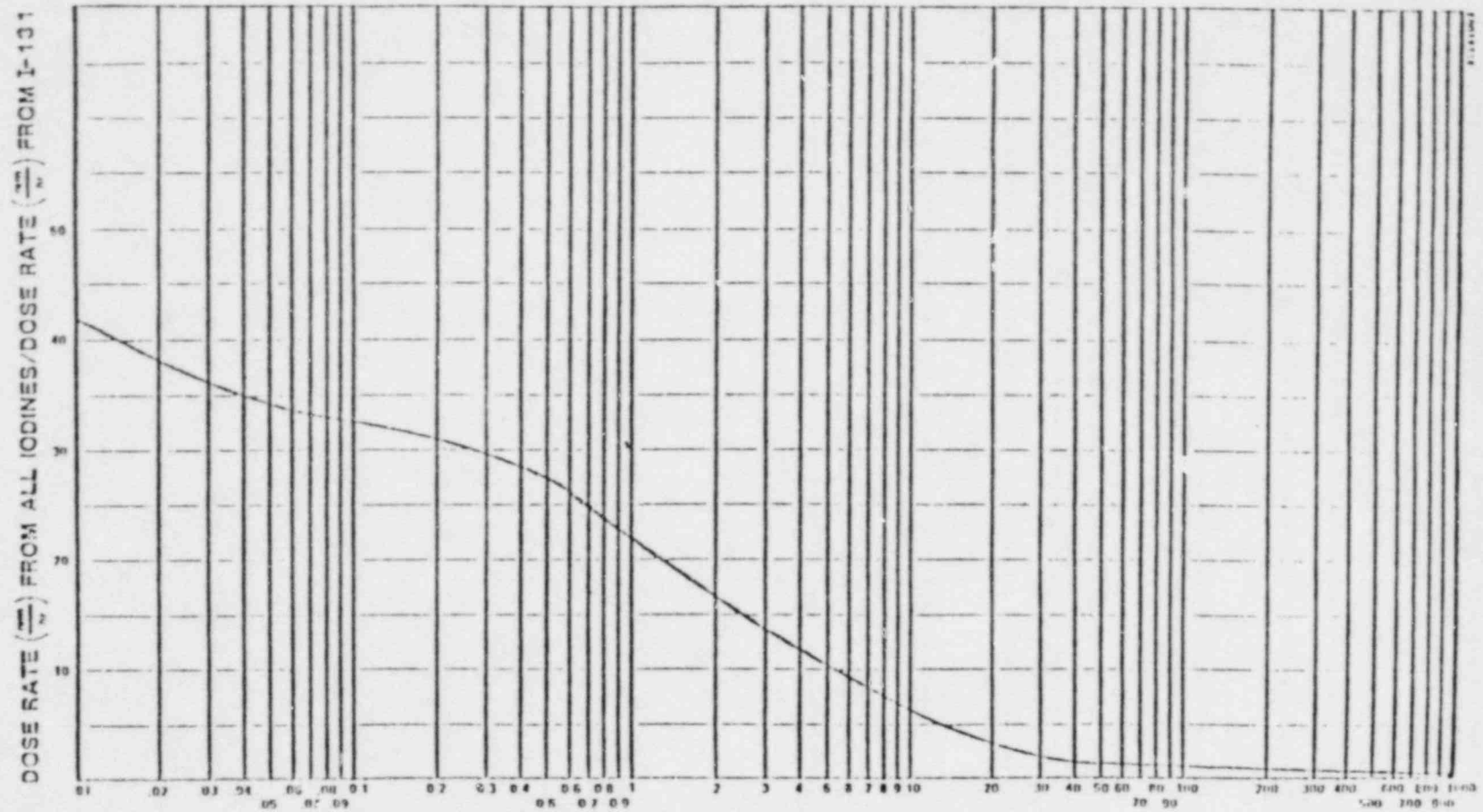
ATTACHMENT G

"EFFECTIVE AGE" DETERMINATION OF NOBLE GASES AS A FUNCTION OF TRANSIT TIME AND THE EFFECTIVE AGE AT RELEASE TIME

Location	Effective Age (hr)	Downwind Distance to Receptor Site (miles)	1609 meter / mile	Wind Speed at 33 ft. (m/sec)	3600 sec / hr.	Transit Time (hr)	Effective Age at Release (hr)	Effective Age at Receptor Site (hr)
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	
			x 1609	-	- 3600 =	+	=	

Name ______________________

RATIO OF THYROID DOSE RATES FROM ALL IODINES TO THYROID DOSE RATES FROM I-131 VERSUS "EFFECTIVE AGE" OF MIXTURE



ATTACHMENT I

"CALCULATION OF DOSE RATES AND INTEGRATED DOSE FOR WHOLE BODY AND THYROID"

Receptor Site Location ______________________________
Name ______________________________

Section A: Whole Body Dose Rates and Integrated Doses from Noble Gases as a Function of Effective Age

Effective Age (hr) (1)	X/Q (sec/m3) (2)		Release Rate RR_{Ngi} (Ci/sec) (3)		E (MeV/dis) (4)	Conv Far mR-dis-m3 / MeV-Ci-hr (5)		Dose Rate Dng (mrem/hr) (6)	Integrated Dose (mrem) Dng1 (mrem/hr) (7)		Dng2 (mrem/hr) (8)		Time2 (hr) (9)		Time1 (hr) (10)		Dose (mrem) (11)
______	______	x	______	x	______	x 9.5E5	=	______	______	+	______						______
______	______	x	______	x	______	x 9.5E5	=	______	______	+	______	÷2 x (	____	-	____	) =	______
______	______	x	______	x	______	x 9.5E5	=	______	______	+	______	÷2 x (	____	-	____	) =	______
______	______	x	______	x	______	x 9.5E5	=	______	______	+	______	÷2 x (	____	-	____	) =	______
______	______	x	______	x	______	x 9.5E5	=	______	______	+	______	÷2 x (	____	-	____	) =	______
______	______	x	______	x	______	x 9.5E5	=	______	______	+	______	÷2 x (	____	-	____	) =	______

Section B: Thyroid Inhalation Dose Rates and Integrated Doses from I-131 as a Function of Effective Age

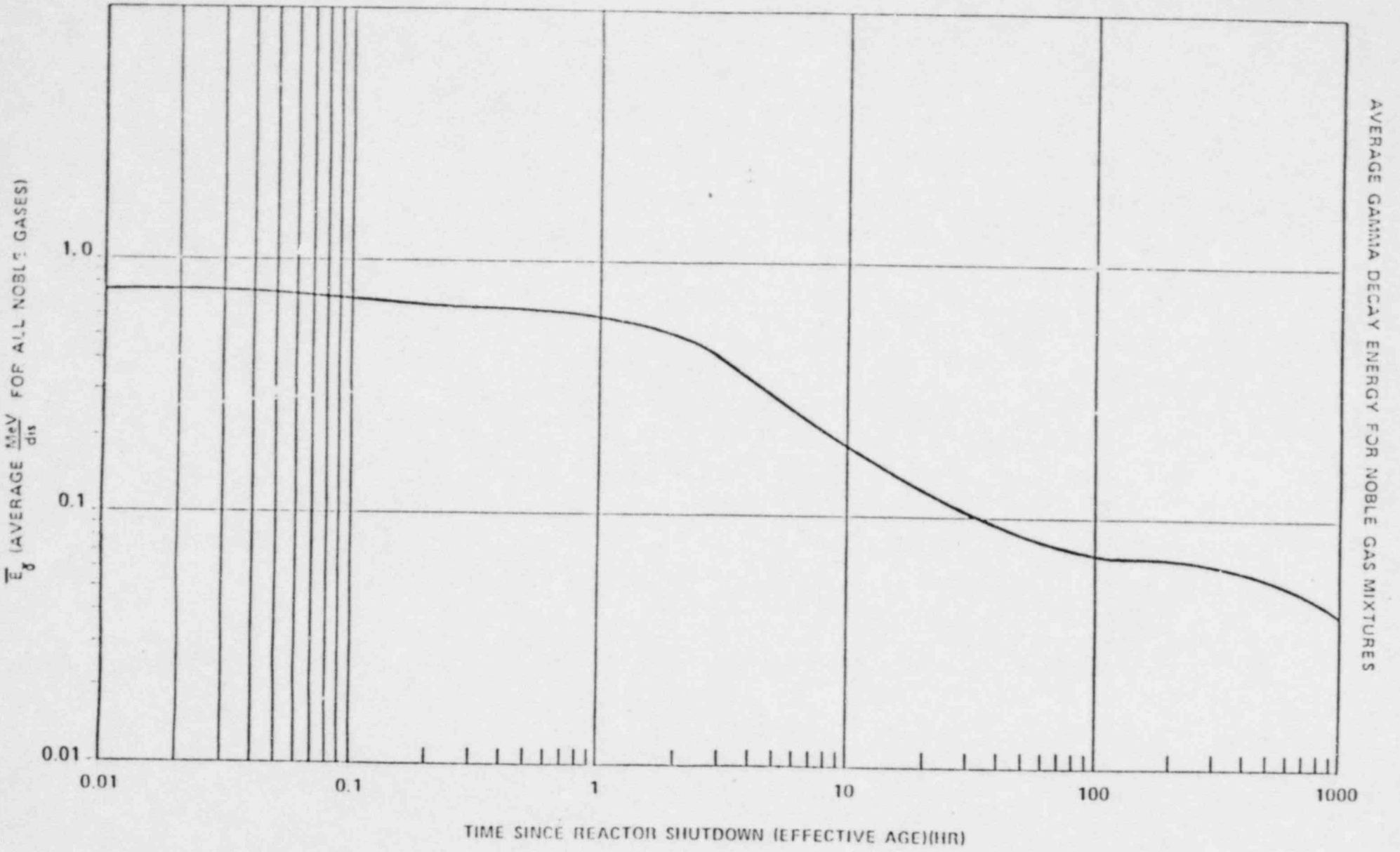
Effective Age (hr) (1)	X/Q (sec/m3) (2)		Release Rate RR_{I-131i} (Ci/sec) (3)		Conv Fac (Rem-m3) / hr-Ci (4)		Dose Rate I-131 (rem/hr) (5)	Integrated Dose (mrem) DI-131(1) (rem/hr) (6)		DI-131(2) (rem/hr) (7)		Time2 (hr) (8)		Time1 (hr) (9)		Dose (rem) (10)
______	______	x	______	x	1.86E6	=	______									
______	______	x	______	x	1.86E6	=	______	______	+	______	÷2x(	____	-	____	) =	______
______	______	x	______	x	1.86E6	=	______	______	+	______	÷2x(	____	-	____	) =	______
______	______	x	______	x	1.86E6	=	______	______	+	______	÷2x(	____	-	____	) =	______
______	______	x	______	x	1.86E6	=	______	______	+	______	÷2x(	____	-	____	) =	______
______	______	x	______	x	1.86E6	=	______	______	+	______	÷2x(	____	-	____	) =	______
______	______	x	______	x	1.86E6	=	______	______	+	______	÷2x(	____	-	____	) =	______

ATTACHMENT I

"CALCULATION OF DOSE RATES AND INTEGRATED DOSE FOR WHOLE BODY AND THYROID"

Section C: Thyroid Inhalation Dose Rates and Integrated Doses From All Radioiodines as a Function of Effective Age.

Effective Age (hr) (1)	I-131 Dose Rate (rem/hr) (2)	Dose Rate From all Iodines / Dose Rate From I-131 (3)		Dose Rate from all Radioiodines (rem/hr) (4)	Integrated Dose (mrem) DI(1) (rem/hr) (5)		DI(2) (rem/hr) (6)		Time 2 (hr) (7)		Time 1 (hr) (8)		Dose (rem) (9)
		x	=			+		÷2x(		-		) =	
		x	=			+		÷2x(		-		) =	
		x	=			+		÷2x(		-		) =	
		x	=			+		÷2x(		-		) =	
		x	=			+		÷2x(		-		) =	
		x	=			+		÷2x(		-		) =	
		x	=			+		÷2x(		-		) =	


AVERAGE GAMMA DECAY ENERGY FOR NOBLE GAS MIXTURES
$\overline{E}_\gamma$ (AVERAGE $\frac{MeV}{dis}$ FOR ALL NOBLE GASES)
1.0
0.1
0.01
0.01
0.1
1
10
100
1000
TIME SINCE REACTOR SHUTDOWN (EFFECTIVE AGE)(HR)

I. PURPOSE

This procedure describes the emergency off-site and site boundary radiological monitoring and field surveys to be undertaken in the event of an airborne release of radioactive gases from CNS. Instructions for the implementation of the program, locating sampling points, collecting samples, and performing field surveys are provided.

II. DISCUSSION

In the event of an accidental radiological release, data obtained from off-site survey will be used to assess the magnitude of the release and to determine which off-site areas have been affected by the release. Data obtained through the off-site survey shall be utilized to determine actual release rates, deposition rates, and actual doses. Dose assessments provide a basis for decision making concerning recommendation of appropriate protective actions in accordance with EPIP 5.7.20; Protective Action Guides.

III. REFERENCE MATERIAL

A. CNS Emergency Plan.

B. NUREG 0654, Rev. 1.

IV. PREREQUISITES

A. A release of airborne gaseous radioactive material has, or potentially, may occur.

B. A dispatch center (appropriate emergency response facility) where survey activities will be coordinated, has been activated.

V. LIMITATIONS

A. None.

VI. PRECAUTIONS

A. Clearly label contaminated material.

B. Check batteries and perform source check test on survey instruments to be used.

C. Methods of communication between the field survey teams and on-site coordinators consist of hand-held radios, and/or radio equipped vehicles.

D. Check with the Radiological Assessment Coordinator if thyroid blocking tablets are appropriate.

E. Check gas level in the vehicles to be used.

VII. EQUIPMENT

A. Environs map.

B. As a minimum, the following equipment, available from the emergency lockers, is required:

1. Survey instrument.

2. Appropriate self-reading dosimeter.

3. TLD.

4. Radio communications equipment - hand-held or vehicle mounted.

5. Air sampler (cartridges and filters).

a. Plastic bags and envelopes for air samples and tape.

C. Use of the following equipment, available from the emergency lockers, should be considered:

1. Protective clothing and/or respirators:

a. Coveralls, hoods, gloves, and shoe covers.

b. Respiratory equipment (self-contained or filter mask).

c. Thyroid blocking tablets.

2. Plastic sheeting.

VIII. PROCEDURE

A. Off-Site And Site Boundary Monitoring.

1. The off-site radiological monitoring team(s) are under the direction of the Radiological Assessment Coordinator who will determine the appropriate location for collecting environmental samples (air, etc.) and performing field surveys.

2. Survey members will be selected from those assembled at the OSCs, EOF, or AEOF. Each team should be comprised of two members. One member should be designated team leader. Each team will:

   a. Receive initial briefing and initial assignments from the Radiological Assessment Coordinator or his designee.

   b. Obtain appropriate equipment from the emergency lockers and perform the following task:

      1) If necessary, don protective clothing and respiratory equipment.

      2) Record the pocket dosimeter readings on Attachment "A".

      3) Check the batteries and perform source check test on the survey instruments to be used.

      4) Obtain the background readings; record these readings on Attachment "A".

      5) Assemble appropriate air sampling equipment (sampler, cartridge, and filter) using the proper cartridge(s).

         a) Identify the flow direction on the filter cartridge before installation.

         b) If both radioiodines and noble gases are to be analyzed use CHARCOAL cartridges.

         c) If only radioiodines are to be evaluated use SILVER ZEOLITE cartridges.

            Note: Noble gas concentrations may be determined by subtracting the silver zeolite results from the charcoal results.

         d) Install a particulate filter and a radioiodine cartridge on the air sampler.

         e) Turn on the air sampler to determine if it is functioning and check for proper flow rate.

3. The Radiological Assessment Coordinator will ensure that the survey teams are in a state of readiness and dispatch them from the EOF. The survey teams will:

   a. Conduct a radio check when leaving the EOF and then maintain radio communications with the EOF.

   b. While in transit leave the survey meter on.

c. At each location perform B-Y dose rate measurements with the GM probe at 3' and 3" above the ground with the window open and the window closed. Record the results on Attachment "A".

d. At the assigned survey area, make several surveys with the GM probe at approximately waist level and at 3" from the ground. These two readings should assist in the evaluation of whether the activity is emanating from an overhead plume or from contamination deposited on the ground.

e. Site boundary survey (see Attachment "B").

1) South boundary survey.

Proceed to the southeast corner of the exclusion area (Nebraska bank of the Missouri River) which is Point #7 on the Site Survey Map. Start at Point #7 on a walking survey of the plant south boundary and ending at Point #11 at the plant southwest exclusion area boundary intersection with the north-south county road. Establish radio communication and relay results on completion of the survey. Unless further instructions are received, return to the EOF for further assignment.

2) West and north boundary survey.

Proceed to Point #11 at the plant southwest exclusion area boundary intersection with the north-south county road. Start at Point #11 on a walking survey of the plant west exclusion area boundary in a north direction to Point #15 at the plant northwest property corner then east along the plant north exclusion area boundary line and ending at Point #16 at the Missouri River. Establish radio communications and relay results on completion of the survey. Unless further instructions are received, return to the EOF for further assignment.

3) East boundary survey.

During travel along the route to the designated survey area observe the radiation survey instrument readings for indications of increased radiation levels and on the return trip confirm suspected off-normal conditions. Proceed northwest to the plant west property boundary intersection with the north-south county road. Turn north on the county road and proceed to Brownville, NE. Cross the Missouri River bridge at Brownville on Highway U.S. #136. After crossing the bridge proceed east on Highway U.S. #136 2 1/4 miles to the intersection

of Highway U.S. #136 and Missouri Highway "U" at Phelps City, MO and turn right (south). Proceed south 2 1/2 miles, turn west 1/2 mile, and then turn south and proceed 1/16 mile to the Rosenbohm farmstead. Enter the access road on the west side of the road across from the Rosenbohm farmhouse. Entry will be made through a closed gate. Follow the access road in a westerly direction to the levee. (Note: This road winds around but eventually leads to the levee.) Proceed north on or along the levee to the northeast corner of the plant site property. At the west access road levee ramp (levee mile 14.5) turn west 1/4 mile and start this leg of the survey at Point #1. Return to the levee road and continue the walking from Point #2 through Point #5. At Point #5 turn west 1/8 mile to the Missouri River bank and pick up Point #6. Relay the results of the survey to the EOF. Unless further instructions are received, return to the EOF for further assignment.

f. Stationary environmental air sampling stations.

1) Assemble needed change out charcoal or silver zeolite cartridges, filter, and plastic bags from the emergency locker (this should be completed before departing the EOF).

2) Proceed to the sample site with the survey meter on.

3) At each location perform B-Y dose rate measurements with the GM probe at 3' and 3" above the ground with the window open and the window closed. Record the results on Attachment "A".

4) Change out the charcoal cartridges and particulate filters. Place the used cartridge and filters in plastic bags.

5) Note station identification, flow rate, and time. Record the data on the plastic bag and Attachment "C".

6) Return the samples to the EOF for analysis, or if directed by the Radiological Assessment Coordinator, proceed to Step h.; determination of gross iodine.

g. Field location environmental air sampling.

1) Use the appropriate filter.

a) Air particulates - particulate filter paper.

b) Radioiodine - may use either cartridge.

1. Charcoal - collects both radioiodine and noble gases.

2. Silver zeolite - collects only radioiodines.

2) Assemble the air sampling equipment in accordance with Step 2.b.5) (this should be completed before arriving at the sampling location).

3) Start the air sampler and record the start time on Attachment "C".

a) Adjust the flow rate and sampling time to the desired level so that the sample volume will be between 1 ft^3 and 15 ft^3. Do not exceed 3 cfm flow rate.

b) Record the start time, stop time, flow rate, location, and sample number on Attachment "C".

c) Seal the particulate paper and radioiodine cartridge in individual plastic bags, date, and label.

d) Return the particulate filter and radioiodine cartridge to the EOF if radioisotopic analysis is required. If not, proceed with Step h. below.

h. Determination of gross iodine (field technique).

1) Place the samples in SAM-2 and determine activity in the cartridge by using Health Physics Procedure 9.6.4; Operation And Calibration Of SAM-2.

2) Determine the mR/Hr reading on the cartridge at 1 cm with E-140 177 c probe or RO-2 with window open. Utilizing the information contained in Attachment "D", determine the gross iodine concentration.

3) If the information presented on Attachment "D" cannot be utilized, calculate the gross iodine concentration from the survey instrument readings using the following equation:

$$\frac{\mu Ci}{cc} = \frac{3.53E\text{-}5}{Eff} \left[\frac{mR/Hr}{V}\right]$$

Where:

mR/Hr = net mR/Hr on the cartridge with E-140 177 c probe or RO-2

Eff = probe efficiency mR/Hr per µCi of I-131 - .062

V = volume of airborne sample (ft^3)

4) Report the concentration to the Radiological Assessment Coordinator and record on Attachment "C".

i. Determination of gross particulate (field technique).

1) The sample may be analyzed by placing the sample in SAM-2 and determining the activity in the filter by using Health Physics Procedure 9.6.4; Operation And Calibration Of SAM-2.

2) With the probe window open obtain a background count rate (E-140 with 177 c probe or RO-2).

3) Place the probe directly adjacent to the (upstream) side of the filter (as close as possible without contaminating the probe). Handle the filters with forceps. Obtain the count rate.

4) Utilizing the information presented on Attachment "E", determine the gross particulate concentration.

5) If the information contained in Attachment "E" can not be utilized, calculate the gross particulate activity from the equation:

$$\frac{\mu Ci}{cc} = \frac{(3.53E\text{-}5)\ (mR/Hr)}{(Eff)\ (V)}$$

Where:

mR/Hr = net mR/Hr on the filter with E-140 177 c probe or RO-2

Eff = probe efficiency mR/Hr per µCi - 7.05

V = volume of airborne sample (ft^3)

6) Report the concentration to the Radiological Assessment Coordinator and record on Attachment "C".

j. Soil sampling.

1) Sample area = 1 m^2.

2) Collect the top surface (< 1/4") using a shovel.

3) Bag, seal, and label the sample.

4) Return the sample to the EOF.

k. Vegetation sampling and counting.

1) Sample area = 1 m^2.

2) Cut the vegetation to a height of 1 cm to 2 cm, being careful not to contaminate the vegetation sample with soil.

3) Bag, seal, and label the sample.

4) Return the sample to the EOF.

IX. ATTACHMENTS

A. Attachment "A", Boundary Survey Map.

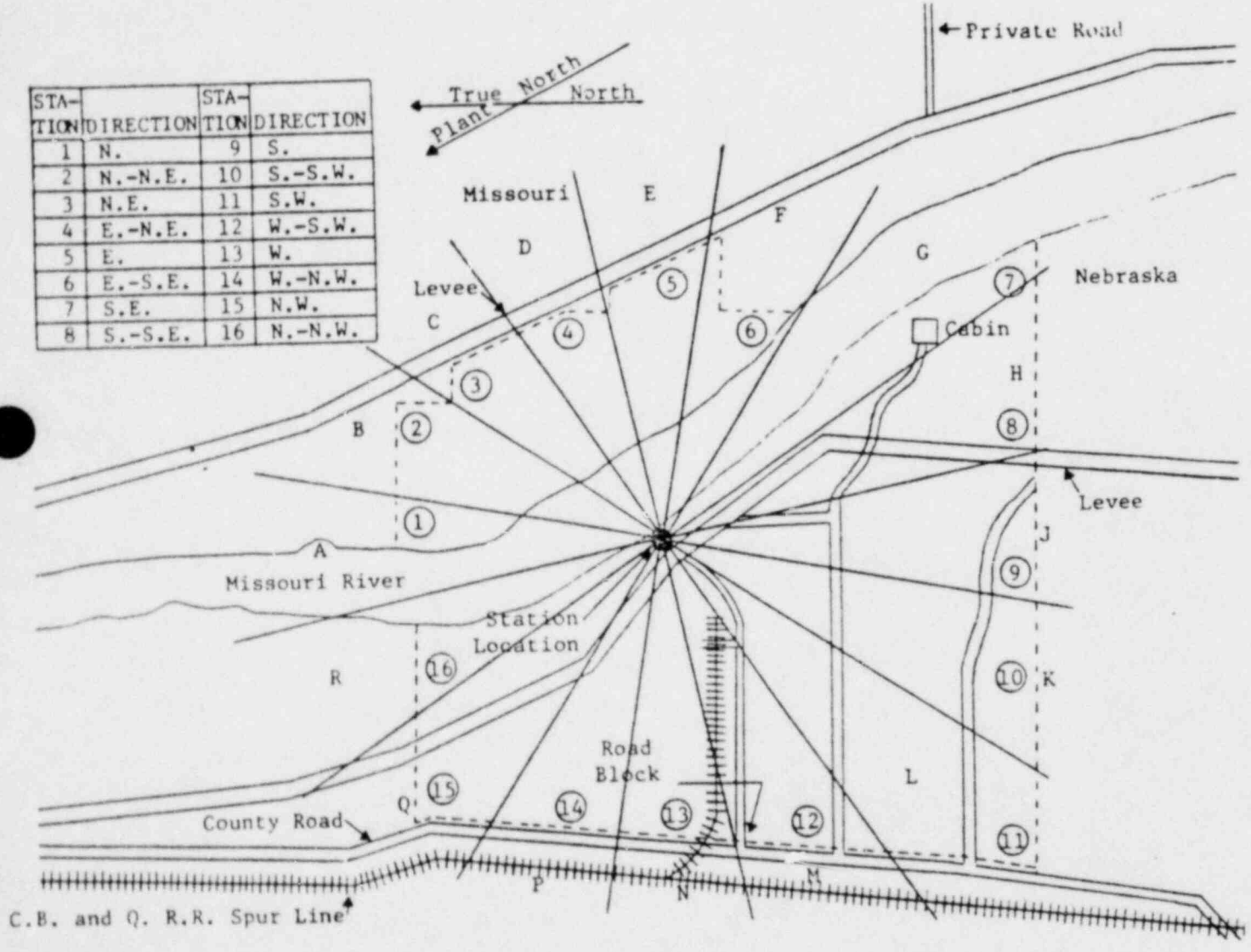
B. Attachment "B", Emergency Off-Site Monitoring - Beta And Gamma Dose Rate Measurements Data Sheet.

C. Attachment "C", Emergency Off-Site Monitoring - Particulate And Radioiodine Samples Data Sheet.

D. Attachment "D", Gross Iodine Concentration Data Sheet.

E. Attachment "E", Gross Particulate Concentration Data Sheet.

STATION	DIRECTION	STATION	DIRECTION
1	N.	9	S.
2	N.-N.E.	10	S.-S.W.
3	N.E.	11	S.W.
4	E.-N.E.	12	W.-S.W.
5	E.	13	W.
6	E.-S.E.	14	W.-N.W.
7	S.E.	15	N.W.
8	S.-S.E.	16	N.-N.W.



EMERGENCY OFF-SITE MONITORING - BETA AND GAMMA DOSE RATE MEASUREMENTS

Team Number: _____ Serial Number: _____ Date: _____ Time: _____ Instrument Type: _____

Team Leader: _____ Dosimeter Out: _____ Dosimeter In: _____

Team Member: _____ Dosimeter Out: _____ Dosimeter In: _____

MONITORING LOCATION	TIME ASSIGNED	TIME RESULTS REPORTED	NET DOSE RATE MR/HR			
			AT 3'		AT 3"	
			GAMMA SHIELD CLOSED	BETA/GAMMA SHIELD OPEN	GAMMA SHIELD CLOSED	BETA/GAMMA SHIELD OPEN

Background (Window Open): _____ mR/Hr Background (Window Closed): _____ mR/Hr

EMERGENCY OFF-SITE MONITORING - PARTICULATE AND RADIOIODINES SAMPLES

MONITORING LOCATION	TIME STARTED	TIME COMPLETED	SAMPLE TIME (MIN)		FLOW RATE (CFM)		SAMPLE VOLUME FT^3	TYPE OF CARTRIDGE	GROSS IODINE*	GROSS PARTICULATE*	OTHER SAMPLES (VEG, SOIL)
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					
				x		=					

*Determine gross iodine and particulate activities from Attachments "D" and "E" respectively. If unable to utilize these attachments, determine these values by the equations presented in Steps 3.h.3) and 3.i.5) of this EPIP.

GROSS IODINE CONCENTRATION

µCi/cc

mR/Hr	1 ft^3	5 ft^3	10 ft^3	15 ft^3
0.05	2.93E-6	1.47E-5	2.93E-7	1.95E-7
0.1	5.86E-6	1.172E-6	5.86E-7	3.91E-7
0.2	1.172E-5	2.344E-6	1.172E-6	7.81E-7
0.3	1.758E-5	3.516E-6	1.758E-6	1.17E-6
0.4	2.344E-5	4.688E-6	2.344E-6	1.563E-6
0.5	2.93E-5	5.86E-6	2.93E-6	1.953E-6
1.0	5.86E-5	1.172E-5	5.86E-6	3.91E-6
2.0	1.172E-4	2.344E-5	1.172E-5	7.813E-6
3.0	1.758E-4	3.516E-5	1.758E-5	1.172E-5
4.0	2.344E-4	4.688E-5	2.344E-5	1.563E-5
5.0	2.93E-4	5.86E-5	2.93E-5	1.953E-5
6.0	3.516E-4	7.032E-5	3.516E-5	2.344E-5
7.0	4.102E-4	8.204E-5	4.102E-5	2.735E-5
8.0	4.688E-4	9.376E-5	4.688E-5	3.125E-5
9.0	5.274E-4	1.055E-4	5.274E-5	3.516E-5
10.0	5.86E-4	1.172E-4	5.86E-5	3.9066E-5
20.0	1.172E-2	2.344E-4	1.172E-4	7.813E-5
30.0	1.758E-2	3.516E-4	1.758E-4	1.172E-4
40.0	2.344E-2	4.688E-4	2.344E-4	1.563E-4
50.0	2.93E-2	5.86E-4	2.930E-4	1.953E-4

GROSS PARTICULATE CONCENTRATION

μCi/cc

mR/Hr	1 ft^3	5 ft^3	10 ft^3	15 ft^3
0.05	2.5E-7	5.0E-8	2.5E-8	1.67E-8
0.1	5.0E-7	1.0E-7	5.0E-8	3.0E-8
0.2	1.0E-6	2.0E-7	1.0E-7	6.0E-8
0.3	1.5E-6	3.0E-7	1.5E-7	1.0E-7
0.4	2.0E-6	4.0E-7	2.0E-7	1.3E-7
0.5	2.5E-6	5.0E-7	2.5E-7	1.6E-7
1.0	5.0E-6	1.0E-6	5.0E-7	3.3E-7
2.0	1.0E-5	2.0E-6	1.0E-6	6.6E-7
3.0	1.5E-5	3.0E-6	1.5E-6	1.0E-6
4.0	2.0E-5	4.0E-6	2.0E-6	1.33E-6
5.0	2.5E-5	5.0E-6	2.5E-6	1.66E-6
6.0	3.0E-5	6.0E-6	3.0E-6	2.0E-6
7.0	3.5E-5	7.0E-6	3.5E-6	2.33E-6
8.0	4.0E-5	8.0E-6	4.0E-6	2.66E-6
9.0	4.5E-5	9.0E-6	4.5E-6	3.0E-6
10.0	5.0E-5	1.0E-5	5.0E-6	3.33E-6
20.0	1.0E-4	2.0E-5	1.0E-5	6.66E-6
30.0	1.5E-4	3.0E-5	1.5E-5	1.00E-5
40.0	2.0E-4	4.0E-5	2.0E-5	1.33E-5
50.0	2.5E-4	5.0E-5	2.5E-5	1.66E-5

I. PURPOSE

The purpose of this procedure is to provide a basis for relating actual or projected plume exposure doses to the EPA Protective Action Guides (PAGs) in order to recommend the appropriate protective actions to the County or State governments.

II. DISCUSSION

Dose estimates (which population groups may potentially receive) are calculated according to the dose assessment methodology described in EPIP 5.7.17; Dose Assessment. These dose estimates are referred to as projected doses. A protective action is an action taken to avoid or reduce a projected dose when the benefits derived from such action are sufficient to offset any undesirable features of the protective action.

III. REFERENCE MATERIAL

A. CNS Emergency Plan.

B. NUREG 0654, Rev. 1.

C. Protective Action Guides And Protective Actions For Nuclear Incidents Manual, U.S. E.P.A., September 1975 (Revised May 1980).

D. Reactor Safety Study, Appendix VI, WASH 1400, October 1975.

IV. PREREQUISITES

A. Projected whole body and thyroid dose rates, as well as integrated doses for critical receptor site locations, have been calculated in accordance with EPIP 5.7.17, Dose Assessment, and such doses warrant recommending protective actions.

V. LIMITATIONS

A. The projected dose and affected off-site areas will depend upon the curies released, release rate, duration of release, isotopic mixture of the release, which varies with effective age, and existing meteorological conditions. The impact of these factors must be assessed in determining the projected dose.

B. PAGs for the general public are given in ranges. The lowest values should be used if there are no major local constraints in providing protection at this level. Local constraints may, however, make the lower values impractical to use, but in no case should the higher value be exceeded in determining a need for protective action.

VI. PRECAUTIONS

A. A protective action guide under no circumstances implies an acceptable dose.

B. Selection of protective actions must be considered subjectively, as conditions beyond the scope of this procedure may exist which, in the opinion of the Emergency Director, override the criteria contained in this procedure.

VII. EQUIPMENT

A. None.

VIII. PROCEDURE

A. Protective Action Guides.

1. The Radiological Assessment Coordinator will periodically update and refine dose assessments for critical receptor site locations in accordance with EPIP 5.7.17, Dose Assessment. He will then relay updated projected doses to the Emergency Director. Attachment "E" may be used as an aid to determine protective actions based on release information.

2. Based upon the projected doses and the guidance given in Attachment "A", the Emergency Director will determine if appropriate protective actions need to be implemented.

3. Should the projected doses indicate that sheltering or evacuation should be considered, the Emergency Director will determine the effectiveness of these protective actions as described in detail below.

a. Sheltering effectiveness.

1) If necessary, recommend that officials warn the affected population to:

a) Seek shelter.

b) Close windows.

c) Turn off ventilation systems.

d) Seal cracks in doors with wet rags.

2) Control access to the affected area.

3) Evaluate the possibility of evacuation after the plume has passed:

a) After the plume has passed, evaluate the significance of ground deposition in accordance with EPIP 5.7.18; Off-Site And Site Boundary Monitoring.

1. Determine if dose rates are sufficient to warrant subsequent evacuation.

a. Multiply the projected dose by the external shielding factor (shielding factors for external whole body gamma doses are presented in Attachment "B"). Compare the projected dose to the PAG for whole body gamma dose.

2. Evaluate the significance of inhalation dose (shielding factors for inhalation doses are presented in Attachment "C"). Shielding factors are for a sealed, wood-frame house.

a. Multiply the projected dose by the inhalation shielding factor to determine the reduction in inhalation dose from the plume. Compare the projected dose to the PAG for thyroid dose.

3. Determine the critical organ of concern, the whole body or the thyroid. Compare the PAG for the critical organ to the PAG for that organ.

b. Evacuation effectiveness.

1) The effectiveness of evacuation in limiting radiation dose is a function of:

a) Time required to evacuate - obtain evacuation times, T(EV), from Attachment "D", Evacuation Times. Alternatively, T(EV) may be estimated as follows:

$$T(EV) = T_D + T_N + T_M + T_T$$

Where:

T_D = Time delay after occurrence of the incident associated with notification of responsible officials, interpretation of data, and the decision to evacuate as a protective action.

T_N = Time required by officials to notify people to evacuate.

T_M = Time required for people to mobilize and get under way.

T_T = Travel time required to leave the affected areas.

If evacuation is completed before the plume arrives, then evacuation is 100% effective.

b) Time of exposure to the plume - Determine the plume arrival time T(PA) as follows:

$T(PA) = T_B + T_T$

Where:

T_B = Time projected before release begins.

T_T = Time projected for plume travel for given wind-speed and downwind distances from the start of release. To calculate T_T refer to Procedure EPIP 5.7.17; Dose Assessment.

Evaluate constraints against evacuation. Compare the evacuation time (TEV) with the estimated plume arrival time T(PA).

1. If there is time to evacuate before the plume arrives, there are no local constraints, evacuation appears to offer a significant reduction in dose, and the societal benefits outweigh the societal cose, recommend evacuation.

2. In cases where there is no time to evacuate prior to the arrival of the plume arrival time and evacuation time are nearly equal and/or there are local constraints, again evaluate the benefits of sheltering (vs. the potential risks of evacuation).

IX. ATTACHMENTS

A. Attachment "A", Recommended Protective Actions.

B. Attachment "B", Reduction In External Gamma Dose From Passing Cloud, SAND 77-1725.

C. Attachment "C", Reduction In Inhalation Dose From Passing Cloud.

D. Attachment "D", Evacuation Times, January 1981 FEMA Contract #EMK-C-0021.

E. Attachment "E", Gross Protective Action Guides.

RECOMMENDED PROTECTIVE ACTIONS TO REDUCE WHOLE BODY AND THYROID DOSE FROM EXPOSURE TO A GASEOUS PLUME

PROJECTED DOSE (REM) TO THE POPULATION	RECOMMENDED ACTIONS (a)	COMMENTS
Whole Body - < 1 Thyroid - < 5	No planned protective actions (c). Off-site authorities may issue an advisory to seek shelter and await further instructions. Monitor environmental radiation levels.	Previously recommended; protective actions may be reconsidered or terminated.
Whole Body - 1 to 5 Thyroid - 5 to 25	Seek shelter as a minimum. Consider evacuation/unless constraints make it impractical. Monitor environmental radiation levels. Control access to affected areas.	If constraints exist to prevent full-scale evacuation, special consideration be given for evacuation of children and pregnant women.
Whole Body - 5 And Above Thyroid - 25 And Above	Conduct mandatory evacuation. Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels. Control access to affected areas.	Sheltering is an alternative if evacuation cannot be promptly accomplished.

(a) These actions are recommended for planning purposes. Protective action decisions at the time of the incident must take existing conditions into consideration (e.g., weather, plume arrival time).

(b) At the time of the incident, officials may implement low-impact protective actions in keeping with the principle of maintaining radiation exposures as low as reasonably achievable (ALARA).

REDUCTION IN EXTERNAL GAMMA DOSE FROM PASSING CLOUD

STRUCTURE OR LOCATION	SHIELDING FACTOR (a) AVERAGE	SHIELDING FACTOR (a) RANGE
Outside	1.0	--
Vehicles	1.0	--
Wood Frame House (No Basement) (b)	0.9	--
Basement Of Wood House	0.6	0.1 to 0.7 (c)
Masonry House (No Basement)	0.6	0.4 to 0.7 (c)
Basement of Masonry House	0.4	0.1 to 0.5 (c)
Large Office or Industrial Building	0.2	0.1 to 0.3 (c,d)

NOTES:

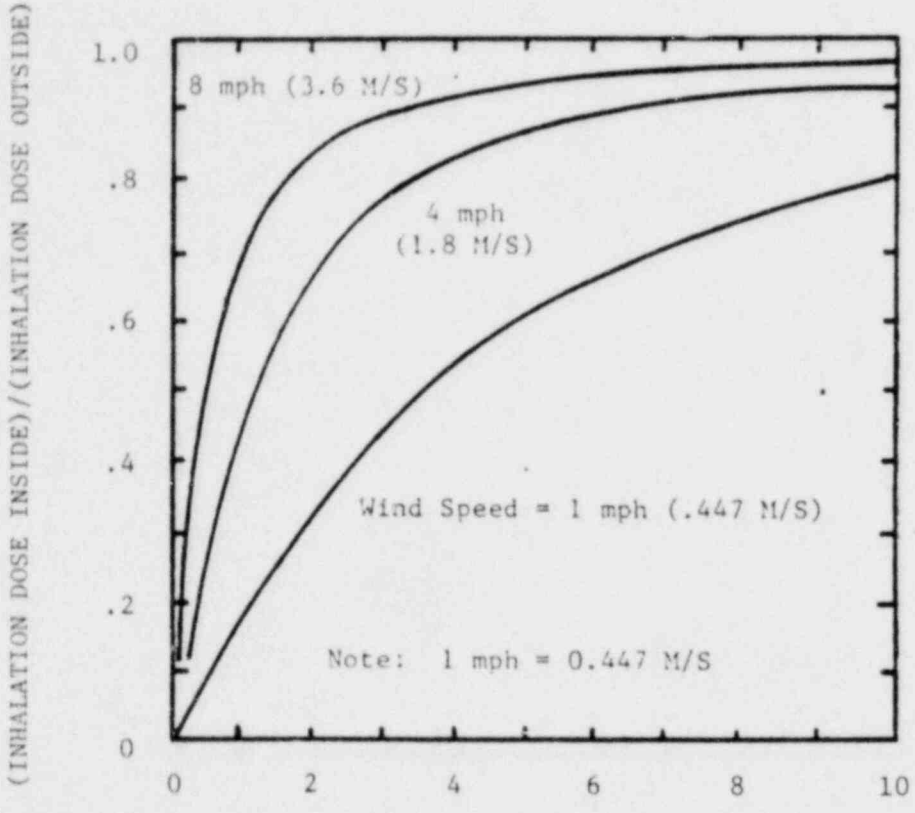
(a) The ratio of the interior dose to the exterior dose.

(b) A wood frame house with brick or stone veneer is approximately equivalent to a house for shielding purposes.

(c) This range is mainly due to different wall materials and different geometries.

(d) The reduction factor depends on where the personnel are located within the building (e.g., the basement or an inside room).

INHALATION SHIELDING FACTORS FOR
A WOOD HOUSE, SNUG DOORS, CLOSED WINDOWS



ESTIMATED EVACUATION TIMES

SECTOR RADIUS (MILES)	SECTOR	POPULATION	EVACUATION ROUTE	EVACUATION TIME (MINUTES) NORMAL	ADVERSE
1-2	A*	0		----	----
1-2	B*	4	9.2 Miles; Gravel Road To U.S. 136 East	18.5	55.25
1-2	C*	0		----	----
1-2	D*	0		----	----
1-2	E*	6	9.9 Miles; Route U To U.S. 136 East	19.9	59.5
1-2	F*	4	10.3 Miles; Route U East To 111 to U.S. 136 East	20.7	61.8
1-2	G*	0		----	----
1-2	H*	0		----	----
1-2	J*	0		----	----
1-2	K*	0		----	----
1-2	L	3	Northeast U.S. 67 South To U.S. 73 South To Falls City	26.0	83.0
1-2	M*	0		----	----
1-2	N	5	U.S. 136 West To U.S. 73/75 North To Nebraska City	26.0	83.0
1-2	P	4	U.S. 136 West To U.S. 73/75 North To Nebraska City	26.0	83.0
1-2	Q*	0		----	----
1-2	R*	0		----	----
2-5	A*	18	9.7 Miles; U.S. 136 East	19.7	58.8
2-5	B*	30	8.7 Miles; U.S. 136 East	17.8	53.4

ESTIMATED EVACUATION TIMES

SECTOR RADIUS (MILES)	SECTOR	POPULATION	EVACUATION ROUTE	EVACUATION TIME (MINUTES) NORMAL	ADVERSE
2-5	C*	45	7.7 Miles; U.S. 136 East	16.0	48.0
2-5	D*	215	8.6 Miles; Route U to U.S. 136 East	20.2	60.5
2-5	E*	110	8.9 Miles; Route E to U.S. 136 East	18.3	57.8
2-5	F*	37	9.8 Miles; Route U to Route E to Route 111 To U.S. 136 East	20.1	60.2
2-5	G*	15	12.4 Miles; Route U to Route E to Route 111 To U.S. 136 East	25.0	74.9
2-5	H*	5	13.3 Miles; Route U to Route E to Route 111 To U.S. 136 East	26.7	79.8
2-5	J	7	Northeast U.S. 67 South To U.S. 73 South To Falls City	19.7	62.0
2-5	K	17	Northeast U.S. 67 South To U.S. 73 South To Falls City	19.7	62.0
2-5	L	210	Northeast U.S. 67 South To U.S. 73 South To Falls City	19.7	62.0
2-5	M	26	Northeast U.S. 67 South To U.S. 73 South To Falls City	19.7	62.0
2-5	N	24	U.S. 136 West To U.S. 73/75 North To Nebraska City	19.7	62.0
2-5	P	46	U.S. 136 West To U.S. 73/75 North To Nebraska City	19.7	62.0
2-5	Q	42	U.S. 136 West To U.S. 73/75 North To Nebraska City	19.7	62.0
2-5	R	187	U.S. 136 West To U.S. 73/75 North To Nebraska City	19.7	62.0

ESTIMATED EVACUATION TIMES

SECTOR RADIUS (MILES)	SECTOR	POPULATION	EVACUATION ROUTE	EVACUATION TIME (MINUTES) NORMAL	ADVERSE
5-10	A*	442	3.3 Miles; Route B East	12.4	38.4
5-10	B*	151	4.7 Miles; Route D to Route B East	11.5	34.4
5-10	C*	635	5.3 Miles; U.S. 275 to U.S. 136 East	19.5	58.4
5-10	D*	1515	3.0 Miles; U.S. 136 East	27.2	81.7
5-10	E*	159	6.2 Miles; Route 111 To U.S. 136 East	14.6	43.8
5-10	F*	59	5.8 Miles; Route 2 To Route J East	12.6	37.2
5-10	G*	95	6.9 Miles; Route 2 To Route J East	14.6	43.7
5-10	H	69	Route U To Route E to Route 111 To U.S. 136 To Maryville	14.6	43.7
5-10	J	115	Northeast U.S. 67 South To U.S. 73 South To Falls City	14.6	43.7
5-10	K	333	Northeast U.S. 67 South To U.S. 73 South To Falls City	14.6	43.7
5-10	L	79	Northeast U.S. 67 South To U.S. 73 South To Falls City	14.6	43.7
5-10	M	111	Northeast U.S. 67 South To U.S. 73 South To Falls City	14.6	43.7
5-10	N	82	U.S. 136 West To U.S. 73/75 North To Nebraska City	12.4	38.4
5-10	P	107	U.S. 136 West To U.S. 73/75 North To Nebraska City	12.4	38.4
5-10	Q	148	U.S. 136 West To U.S. 73/75 North To Nebraska City	12.4	38.4
5-10	R	1236	U.S. 136 West To U.S. 73/75 North To Nebraska City	12.4	38.4

*Data Obtained From Evacuation Time Estimate Study January 1981.

GROSS PROTECTIVE ACTION GUIDES

In the ranges shown, the lowest value should be used if there are no major local constraints in providing protection at that level, especially to sensitive populations. Local constraints may make lower values impractical to use, but in no case should the higher value be exceeded in determining the need for protective action.

The attached chart may be used for preliminary determination of the Integrated Doses for downwind receptor points during an accident situation at CNS.

Calculation of time before Protective Action Guides (PAGs) are reached may be done using the following formula and attached Table. The Table includes PAGs for the Projected Whole Body Gamma Dose (Rem) and Projected Thyroid Dose (Rem) for Atmospheric Stability Classes B, D, and F. Each stability class if divided into wind speeds of 22.5, 10, and 5 mph. The stability classes represent a bracketing of the seven (7) Pasquill Catagories of A, B, C, D, E, F, and G. The listed wind speeds are intended to bracket winds experienced 90% of the time at CNS. For wind speeds between those listed the more conservative (safe) times should be used.

The following formula shall be used to calculate the Actual Time (HOURS) to reach PAGs, based on Actual Emission Rates in Ci/Sec.

$$\frac{100 \text{ Ci/Sec}}{\text{Actual Emission Rate (Ci/Sec)}} \times \text{Chart Time} = \text{Actual Time (Hours) To Reach PAGs}$$

GROSS PROTECTIVE ACTION GUIDES

STABILITY CLASS B									
WIND VELOCITY MPH	PROTECTIVE* ACTION GUIDES		TIME (HOURS) TO REACH PROTECTIVE ACTION GUIDE (PAGE) INTEGRATED DOSE AT AN ERP RELEASE RATE OF 100 Ci/Sec DISTANCE DOWNWIND OF CNS - (MILES)							
			1.5	2.5	3.5	5	10	20	35	50
22.5	THYROID -	5 REM-PAG	94	227	312	416	757	1388	2272	-----
		25 REM-PAG	471	1136	1562	2083	3787	6944	11363	-----
	EXTERNAL -	1 REM-PAG	188	454	625	833	1639	3225	-----	-----
		5 REM-PAG	943	2272	3125	4166	8196	16129	-----	-----
10	THYROID -	5 REM-PAG	41	102	131	185	333	1724	-----	-----
		25 REM-PAG	208	510	657	925	1666	8620	-----	-----
	EXTERNAL -	1 REM-PAG	83	212	285	400	833	5000	-----	-----
		5 REM-PAG	416	1063	1428	2000	4166	25000	-----	-----
5	THYROID -	5 REM-PAG	20	50	66	90	250	757	-----	-----
		25 REM-PAG	104	250	333	454	1250	3787	-----	-----
	EXTERNAL -	1 REM-PAG	45	107	151	222	500	2941	-----	-----
		5 REM-PAG	227	537	757	1111	2500	14700	-----	-----

STABILITY CLASS D									
WIND VELOCITY MPH	PROTECTIVE* ACTION GUIDES		TIME (HOURS) TO REACH PROTECTIVE ACTION GUIDE (PAGE) INTEGRATED DOSE AT AN ERP RELEASE RATE OF 100 Ci/Sec DISTANCE DOWNWIND OF CNS - (MILES)							
			1.5	2.5	3.5	5	10	20	35	50
22.5	THYROID -	5 REM-PAG	18	22	31	41	100	238	500	-----
		25 REM-PAG	92	113	156	208	500	1190	2500	-----
	EXTERNAL -	1 REM-PAG	37	45	62	90	217	555	1298	-----
		5 REM-PAG	185	227	312	454	1086	2777	6493	-----
10	THYROID -	5 REM-PAG	8	9	13	19	45	416	-----	-----
		25 REM-PAG	40	49	65	96	227	2083	-----	-----
	EXTERNAL -	1 REM-PAG	16	20	27	43	107	1176	-----	-----
		5 REM-PAG	83	102	138	217	537	5882	-----	-----
5	THYROID -	5 REM-PAG	4	5	6	9	22	156	-----	-----
		25 REM-PAG	20	25	32	48	113	781	-----	-----
	EXTERNAL -	1 REM-PAG	8	11	15	23	66	625	-----	-----
		5 REM-PAG	41	56	75	116	333	3125	-----	-----

*Refer To Page 1 Of This Attachment.

GROSS PROTECTIVE ACTION GUIDES

STABILITY CLASS F									
WIND VELOCITY MPH	PROTECTIVE* ACTION GUIDES		TIME (HOURS) TO REACH PROTECTIVE ACTION GUIDE (PAGE) INTEGRATED DOSE AT AN ERP RELEASE RATE OF 100 Ci/Sec DISTANCE DOWNWIND OF CNS - (MILES)						
			1.5	2.5	3.5	5	10	20	35	50
22.5	THYROID -	5 REM-PAG	-----	250	106	63	53	71	106	-----
		25 REM-PAG	-----	-----	531	316	265	357	531	-----
	EXTERNAL -	1 REM-PAG	-----	500	217	131	114	169	285	-----
		5 REM-PAG	-----	2500	1086	657	574	847	1428	-----
10	THYROID -	5 REM-PAG	-----	108	45	27	23	178	-----	-----
		25 REM-PAG	-----	543	227	138	119	892	-----	-----
	EXTERNAL -	1 REM-PAG	-----	227	100	62	58	500	-----	-----
		5 REM-PAG	-----	1136	500	312	294	2500	-----	-----
5	THYROID -	5 REM-PAG	833	54	22	14	12	72	-----	-----
		25 REM-PAG	4166	271	113	71	60	362	-----	-----
	EXTERNAL -	1 REM-PAG	-----	120	52	34	35	294	-----	-----
		25 REM-PAG	-----	602	263	172	178	1470	-----	-----

*Refer To Page 1 Of This Attachment.

I. PURPOSE

This procedure provides a means of insuring the operational readiness and availability of equipment required for the immediate action steps of all four Emergency Classification action levels.

II. DISCUSSION

As an emergency situation progresses, conditions may arise which require augmentation of emergency equipment. The necessary equipment will be utilized on an as-needed basis to support the emergency operations.

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev 1

IV. PREREQUISITES

None

V. LIMITATIONS

None

VI. PRECAUTIONS

None

VII. EQUIPMENT

A. Equipment covered by this procedure includes:

1. First aid and rescue equipment
2. Respiratory protection equipment
3. Vehicles and radio equipment
4. Radiation detection equipment
5. Decontamination equipment and supplies
6. General emergency equipment and supplies

VIII. PROCEDURE

A. Once per quarter and/or after use, emergency equipment will be inventoried and the equipment calibrations checked. Operability and equipment maintenance will be conducted in accordance with normal station procedures.

B. During inspection, any equipment found inoperative or out of calibration shall be replaced in a timely manner.

C. During inspection any deficiency of inventory shall be resolved by replacement in a timely manner.

D. Normal use equipment located in the OSC's may be used during emergency situations. This was one of the criteria of the placement of the OSC's, personnel assembled at these locations will have access to equipment and supplies they are familiar with in their normal duties that may be used during an emergency and dependent upon the emergency condition.

IX. ATTACHMENTS

Attachment A - "Emergency Equipment Maintained at the Control Room"

Attachment B - "Emergency Equipment Maintained at the TSC"

Attachment C - "Emergency Equipment Maintained at the OSC's"

Attachment D - "Emergency Equipment Maintained at the EOF"

Attachment E - "Emergency Equipment Maintained at the AEOF"

Attachment F - "Emergency Equipment for the Ambulance"

Attachment G - "Emergency Equipment Maintained at the Hospital"

Attachment H - "Emergency Vehicles Maintained at CNS"

Emergency Equipment Maintained in the Control Room

I. General Supplies

Item		Quantity
A.	Coveralls, Large.	4 Each
B.	Hood Canvas.	4 Each
C.	Shoe Covers, Latex.	12 Pair
D.	Shoe Covers, Canvas.	8 Pair
E.	Gloves, Surgeon's.	24 Pair
F.	Glove Liners, White Cotton.	24 Pair
G.	Gloves, Plastic Covered.	4 Pair
H.	Gloves, White Cotton (Work).	12 Pair
I.	Extended Probe Teletector (Range 0 to 1,000 R/Hr).	1 Each
J.	Geiger-Mueller Survey Meter (Range 0 to 50 mR/Hr).	1 Each
K.	Ion-Chamber RO-2 (Range 0 to 50 R/Hr).	1 Each
L.	Dosimeter, Direct Reading (1 R).	6 Each
M.	Dosimeter, Direct Reading (0 to 10 R).	4 Each
N.	Dosimeter, Direct Reading (0 to 200 mR).	4 Each
O.	Dosimeter Charger.	1 Each
P.	Batteries for Dosimeter Charger.	1 Set
Q.	Thyroid Blocking Tablets	10 Bottles

Emergency Equipment Maintained in the Control Room (Cont'd)

Item	Quantity
II. Respiratory Protection Equipment	
A. Air Breathing Masks (Self-Contained) (Complete in Case, 45 FT^3 Tank).	3 Each
B. Full Face Filter Masks with Filters.	6 Each
C. Spare 45 Ft^3 Air Cylinders.	3 Each

☆ Note: The air breathing equipment is not within the Emergency Box, but the cases are rack-wall-mounted near the Emergency Box for convenience, inspection, and maintenance.

III. Miscellaneous (Supplies)	
A. Masking Tape, Paper, 2".	3 Rolls
B. Masking Tape, Cloth, 2".	3 Rolls
C. Plastic Sheeting, 20' x 20'.	2 Sheets
D Plastic Bag, Small.	1 Box
E. Plastic Bag, Large.	6 Each
F. Radiation Warning Signs.	12 Each
G. File Cards, 3" x 5".	1 Pkg.
H. Radiation Barrier Rope, 200 ft.	1 Coil
I. Smear Papers, 100s.	12 Box
J. Radiation Warning Tape.	1 Roll
K. Pad, Paper, 8 1/2" x 11".	2 Each
L. Pad, Paper, 5" x 8".	2 Each
M. Pencils, Lead.	6 Each
N. Pencils,. Grease Type, Red.	6 Each
O. Stapler with Staples	1 each

Emergency Equipment Maintained in the Control Room (Cont'd)

III. Miscellaneous Supplies (cont)

Item	Quantity
P. Envelopes, Manila, 3" x 5", 100s.	2 Each
Q. Clipboards.	2 Each
R. Hand Lantern, Battery Type.	2 Each
S. Flashlight, Battery Type.	2 Each
T. Sets of Batteries for Hand Lantern.	2 Sets
U. Sets of Batteries for Flashlights.	2 Sets
V. Scissors, Blunt Point, 6"	1 Set
W. Step Off Pad	2 Each

Emergency Equipment Maintained in the TSC

I.	Equipment and Reference Documents	
A.	Copy Machine	1 Each
B.	Telecopier	1 Each
C.	Telephones; includes NRC Extensions	9 Each
D.	Radio Remote Control Units	2 Each
E.	Zytron Terminals	1 Each
F.	Alternate Intercom (Bone Phone)	1 Each
G.	Dose Assessment Equipment	
	Computer Terminal	1 Each
	Inopleths, Maps	1 Set
H.	CNS Tech. Specs.	1 Set
I.	CNS Final Safety Analysis Report	1 Set
J.	Flow Diagrams and Drawings	1 Set
K.	State Emergency Response Plans (Nebraska, Missouri, Kansas, Iowa)	1 Each
L.	Local Emergency Response Plans (Nemaha, Richardson, Otoe Relocation Plan, Nebraska EPZ Evacuation Study, and Atchison Counties)	1 Each
M.	Emergency Plan, Complete Set of EPIP's, and Emergency Telephone Directory	1 Each

Emergency Equipment Maintained in the TSC (Cont'd.)

II. General Supplies

Item		Quantity
A.	Coveralls, Large.	4 Each
B.	Hood Canvas.	4 Each
C.	Shoe Covers, Latex.	12 Pair
D.	Shoe Covers, Canvas.	8 Pair
E.	Gloves, Surgeon's.	24 Pair
F.	Glove Liners, White Cotton.	24 Pair
G.	Gloves, Plastic Covered.	4 Pair
H.	Gloves, White Cotton (Work).	12 Pair
I.	Masking Tape	2 Rolls
J.	Ion-Chamber RO-2 (Range 0 to 50 R/Hr).	1 Each
K.	Dosimeter, Direct Reading (1 R).	5 Each
L.	Dosimeter Charger.	1 Each
M.	Batteries for Dosimeter Charger.	1 Set
N.	Sound Power Set.	2 Sets
O.	Sound Power Extensions.	2 Sets
P.	Flashlights.	2 Each
Q.	Flashlight Batteries.	2 Sets
R.	Self-Contained Breathing Apparatus.	4
S.	Spare Bottles for SCBA.	2
T.	Full Face Particulate Respirators and Cartridges.	6
U.	Thyroid Blocking Tablets.	10 Bottles
V.	Clipboards.	3
W.	Step Off Pads.	1
X.	Emergency Action Logs.	10 Pads

III. EPIPs for Emergency Use

EPIP NO.	TITLE	QUANTITY
5.7.1	Emergency Classification	2
5.7.2	NOTIFICATION OF UNUSUAL EVENT Implementing Actions	2
5.7.3	ALERT Implementing Actions	2
5.7.4	SITE AREA EMERGENCY Implementing Actions	4
5.7.5	GENERAL EMERGENCY Implementing Actions	4
5.7.6	Notification	10
5.7.7	Activation of the TSC	10
5.7.10	Personnel Assembly and Accountability	5
5.7.11	Evacuation of Non-Essential Site Personnel	10
5.7.13	Personnel Monitoring and Decontamination	10
5.7.14	Stable iodine Thyroid Blocking	4
5.7.15	Rescue and Reentry	3
5.7.16	Release Rate Determination	2
5.7.17	Dose Assessment	14
5.7.18	Offsite and Site Boundary Monitoring	5
5.7.19	Onsite Radiological Monitoring	2
5.7.23	Media	5
5.7.24	Medical	4

Emergency Equipment Maintained at the OSCs

I. Health Physics OSC

General Supplies

Item		Quantity
A.	Clipboards	4
B.	Note Pads	4
C.	Pencils	12
D.	Flashlights	3
E.	Masking Tape	2 Rolls
F.	Emergency Action Log	2 Pads
G.	Dosimeters (1R)	5
H.	High Range Survey Instrument	2
I.	RO-2	2
J.	Hi-Vol Air Sampler	*
K.	Particulate Filters (2" and 4")	20 Each
L.	Charcoal and Silver Zeolite, Cartridges	10 Each
M.	Air Sample Plastic Bags and Labels	20
N.	Smear Supplies (Books)	10
O.	Batteries for Flashlights	3 Sets
P.	Dosimeter Charger	1
Q.	Batteries for Charger	1 Set
R.	Step Off Pads	1 Set

Protection Equipment

A.	Protective Clothing (Full Set)	6
B.	Self-Contained Breathing Apparatus	4
C.	Spare Bottles	2
D.	Thyroid Blocking Tablets	10 Bottles

EPIPs for Emergency Use

A.	EPIP 5.7.13 Personnel Monitoring and Decontamination	10
B.	EPIP 5.7.15 Rescue and Reentry	5
C.	EPIP 5.7.19 Onsite and Radiological Monitoring	5
D.	EPIP 5.7.24 Medical	3
E.	EPIP 5.7.9 Accountability	2

*Available from Normal Use Work Area

II. I&C/Electrical OSC

General Supplies

Item		Quantity
A.	Dosimeters (1R)	5
B.	Survey Instruments (Cutie Pie)	1
C.	Masking Tape	2 Rolls
D.	I&C/Electrical Tool Kits	4
E.	Flashlights	4
F.	Simpson VOM	2
G.	Sound Power Sets	2
H.	Sound Power Extensions	2
I.	Emergency Action Logs	2 Pads
J.	Pencils	10
K.	Batteries for Flashlights	4 Sets
L.	Dosimeter Charger	1
M.	Batteries for Charger	1 Set
N.	Step Off Pads	2

Protection Equipment

A.	Protective Clothing (Full Set)	6
B.	Self-Contained Breathing Apparatus	4
C.	Spare Bottles	2
D.	Full Face Particulate Respirators and Cartridges	6
E.	Thyroid Blocking Tablets	10 Bottles

EPIPs for Emergency Use

A.	EPIP 5.7.13 Personnel Monitoring and Decontamination	10
B.	EPIP 5.7.15 Rescue and Reentry	5
C.	EPIP 5.7.24 Medical	3
D.	EPIP 5.7.9 Accountability	2

III. Mechanical Maintenance OSC

General Supplies

Item		Quantity
A.	Dosimeters (1R)	5
B.	Survey Instruments (Cutie Pie)	1
C.	Masking Tape	2 Rolls
D.	Flashlights	4
E.	Emergency Action Logs	2 Pads
F.	Pencils	10
G.	Batteries for Flashlights	4 Sets
H.	Dosimeter Charger	1
I.	Batteries for Charger	1 Set
J.	Step Off Pads	2

Protection Equipment

A.	Protective Clothing (Full Set)	6
B.	Self-Contained Breathing Apparatus	4
C.	Spare Bottles	2
D.	Full Face Particulate Respirators and Cartridges	6
E.	Thyroid Blocking Tablets	10 Bottles

EPIPs for Emergency Use

A.	EPIP 5.7.13 Personnel Monitoring and Decontamination	10
B.	EPIP 5.7.15 Rescue and Reentry	5
C.	EPIP 5.7.24 Medical	3
D.	EPIP 5.7.9 Accountability	2

Emergency Equipment Maintained at the EOF

I. General Supplies

Item		Quantity
A.	Coveralls, Large.	6 Each
B.	Hood Canvas.	6 Each
C.	Shoe Covers, Latex.	12 Pair
D.	Shoe Covers, Canvas.	12 Pair
E.	Gloves, Surgeon's.	24 Pair
F.	Glove Liners, White Cotton.	24 Pair
G.	Gloves, Plastic Covered.	8 Pair
H.	Hard Hat.	6 Each
I.	Gloves, White Cotton (Work).	12 Pair
J.	Extendable Probe Survey Instrument (Range 0 - 1,000 R/Hr.)	2 Each
K.	Ion-Chamber Survey Meter (Range 0 to 50 R/Hr).	2 Each
L.	Geiger-Mueller Survey Meter (Range 0 to 50 mR/Hr).	4 Each
M.	Ion-Chamber (Range 0 to 25 R/Hr).	2 Each
N.	Sample Holder with Pancake Type Detector	1 Each
O.	Scaler Electronic Package (MS-2 or LCS-1)	1 Each
P.	Dosimeter, Direct Reading (1 R).	6 Each
Q.	Dosimeter, Direct Reading (0 to 10 R).	6 Each
R.	Dosimeter, Direct Reading (0 to 200 mR).	4 Each
S.	Dosimeter Charger.	1 Each
T.	Batteries for Dosimeter Charger.	1 Set
U.	Portable Air Sampler (High Volume) (60 Hz, 120 VAC).	3 Each

Emergency Equipment Maintained at the EOF

I. General Supplies (cont)

Item	Quantity
V. Portable Air Sampler (Low Volume).	1 Each
W. Inverter (12 V DC to 120 V AC).	2 Each
X. Filters for Air Samplers:	
1. 4" for High Volume.	100 Each
2. 47 mm for Low Volume.	100 Each
Y. Charcoal Filter for Air Samplers.	25 Each
Z. Silver Zeolite Cartridges for Air Samplers	25 Each
AA. Extension Cord, Electric (50 Ft).	2 Each
BB. Offsite Radios (Low Band)	2 Each

II. Respiratory Protection Equipment*

A. Air Breathing Masks (Self-Contained) (Complete in Case, 45 FT^3 Tank).	4 Each
B. Full Face Filter Masks with Filters.	6 Each
C. Spare 45 Ft^3 Air Cylinders.	2 Each

* Note: The air breathing equipment is not within the Emergency Box, but the cases are rack-wall-mounted near the Emergency Box for convenience, inspection, and maintenance.

III. Miscellaneous (Supplies)

A. Masking Tape, Paper, 2".	3 Roll
B. Masking Tape, Cloth, 2".	3 Roll
C. Plastic Sheeting, 20' x 20'.	2 Sheet
D. Plastic Bag, Small.	1 Box
E. Plastic Bag, Large.	6 Each
F. Radiation Warning Signs.	12 Each

Emergency Equipment Maintained at the EOF

Item		Quantity
III.	Miscellaneous (Supplies) (cont)	
G.	File Cards, 3" x 5".	1 Pkg.
H.	Radiation Barrier Rope, 200 ft.	1 Coil
I.	Smear Papers, 100s.	12 Box
J.	Radiation Warning Tape.	1 Roll
K.	Pad, Paper, 8 1/2" x 11".	6 Each
L.	Pad, Paper, 5" x 8".	6 Each
M.	Pencils, Lead.	6 Each
N.	Pencils,. Grease Type, Red.	6 Each
O.	Stapler with Staples	1 each
P.	Envelopes, Manila, 3" x 5", 100s.	2 Each
Q.	Clipboards.	4 Each
R.	Hand Lantern, Battery Type.	3 Each
S.	Flashlight, Battery Type.	2 Each
T.	Sets of Batteries for Hand Lantern.	3 Sets
U.	Sets of Batteries for Flashlights.	2 Sets
V.	Flares, Railroad Type	6 Each
W.	Pocket Knife.	1 Each
X.	Small Hand Tool Kit with Straight Slot Screwdrivcer, Phillips Screwdriver, Small Pliers, and Small Vise Grip.	1 Each
Y.	Scissors, Blunt Point, 6".	1 Each
Z.	Shovel.	1 Each

Emergency Equipment Maintained at the EOF

Item		Quantity
III.	Miscellaneous (Supplies) (cont)	
AA.	Vials, 5 ml.	12 Each
BB.	Pipette with Rubber Bulb.	12 Each
CC.	Liter Bottle.	6 Each
DD.	Step Off Pads	2 Each
IV.	Personnel Decontamination Supplies	
A.	Potassium Permanganate	6 Vial
B.	Instructions for making the 4% Solution of Potassium Permanganate	1 Set
C.	Sodium Bisulfite	6 Vials
D.	Titanium Dioxide	3 Jars
E.	Alkanox	2 Cans
F.	Tide, Detergent Soap	1 Box
G.	Septisol (Germicide)	1 Can
H.	Lanolin	1 Jar
I.	Swabs, Cotton Tipped, 100s	3 Pkgs.
J.	Compresses, Gauze, 3" X 3", 100s	2 Pkgs.
K.	Towels, Paper	1 Roll
L.	Beaker, Plastic. 100 ml.	3 Each
M.	Hand Brush	2 Each
N.	Thyroid Blocking Tablets	1350 Bottles
V.	First Aid and Rescue Equipment	
A.	First Aid Kit	1 Each
B.	Stretcher*	1 Each
C.	Rope, 1/2 inch - 50 ft.	1 Coil

*Note: Stretcher stored near Emergency Box.

Emergency Equipment Maintained at the EOF

VI.	Additional Equipment and Reference Documents	
A.	Copy Machine	1 Each
B.	Telecopies	2 Each
C.	Typewriter	1 Each
D.	Telephones	10 Each
E.	C.D. Intercom	1 Each
F.	Radio Remote Control Units	2 Each
G.	Portable Radios (Low Band)	2 Each
H.	Alternate Intercom (Bone Phone)	1 Each
I.	Dose Assessment Equipment	
	Computer Terminal	1 Each
	Inopleths, Maps	1 Set
J.	CNS Tech. Specs.	1 Set
K.	CNS Final Safety Analysis Report	1 Set
L.	Flow Diagrams and Drawings	1 Set
M.	State Emergency Response Plans (Nebraska, Missouri, Kansas, Iowa)	1 Each
N.	Local Emergency Response Plans (Nemaha, Richardson, Otoe Relocation Plan, Nebraska EPZ Evacuation Study, and Atchison Counties)	1 Each
O.	Emergency Plan and Complete Set of EPIP's, Emergency Telephone Directory	2 Each

Emergency Equipment Maintained at the EOF

VII. EPIPs for Emergency Use

EPIP NO.	TITLE	QUANTITY
5.7.1	Emergency Classification	2
5.7.2	NOTIFICATION OF UNUSUAL EVENT Implementing Actions	2
5.7.3	ALERT Implementing Actions	2
5.7.4	SITE AREA EMERGENCY Implementing Actions	4
5.7.5	GENERAL EMERGENCY Implementing Actions	4
5.7.6	Notification	10
5.7.9	Activation of the EOF	10
5.7.10	Personnel Assembly and Accountability	5
5.7.11	Evacuation of Non-Essential Site Personnel	10
5.7.13	Personnel Monitoring and Decontamination	10
5.7.14	Stable iodine Thyroid Blocking	4
5.7.15	Rescue and Reentry	3
5.7.16	Release Rate Determination	7
5.7.17	Dose Assessment	14
5.7.18	Offsite and Site Boundary Monitoring	5
5.7.19	Onsite Radiological Monitoring	2
5.7.23	Media	10
5.7.24	Medical	4

Emergency Equipment Maintained At the AEOF

I. General Supplies

Item		Quantity
A.	Coveralls, Large.	6 Each
B.	Hood Canvas.	6 Each
C.	Shoe Covers, Latex.	12 Pair
D.	Shoe Covers, Canvas.	12 Pair
E.	Gloves, Surgeon's.	24 Pair
F.	Glove Liners, White Cotton.	24 Pair
G.	Gloves, Plastic Covered.	8 Pair
H.	Hard Hat.	6 Each
I.	Gloves, White Cotton (Work).	12 Pair
J.	Ion-Chamber Survey Meter (Range 0 to 1,000 R/Hr).	1 Each
K.	Geiger-Mueller Survey Meter (Range 0 to 50 mR/Hr).	1 Each
L.	Ion-Chamber (Range 0 to 25 R/Hr).	1 Each
M.	Sample Holder with Pancake Type Detector	1 Each
N.	Scaler Electronic Package (MS-2 or LCS-1)	1 Each
O.	Dosimeter, Direct Reading (1 R).	6 Each
P.	Dosimeter, Direct Reading (0 to 10 R).	6 Each
Q.	Dosimeter, Direct Reading (0 to 200 mR).	2 Each
R.	Dosimeter Charger.	1 Each
S.	Batteries for Dosimeter Charger.	1 Set

Emergency Equipment Maintained At the AEOF

I. General Supplies (cont)

Item	Quantity
T. Portable Air Sampler (High Volume) (60 Hz, 120 VAC).	3 Each
U. Portable Air Sampler (Low Volume).	1 Each
V. Inverter (12 V DC to 120 V AC).	2 Each
W. Filters for Air Samplers:	
1. 4" for High Volume.	100 Each
2. 47 mm for Low Volume.	100 Each
X. Charcoal Filter for Air Samplers.	25 Each
Y. Silver Zeolite Cartridges for Air Samplers	25 Each
Z. Extension Cord, Electric (50 Ft).	1 Each

II. Respiratory Protection Equipment*

A. Air Breathing Masks (Self-Contained) (Complete in Case, 45 FT^3 Tank).	2 Each
B. Full Face Filter Masks with Filters.	6 Each
C. Spare 45 Ft^3 Air Cylinders.	2 Each

* Note: The air breathing equipment is not within the Emergency Box, but the cases are rack-wall-mounted near the Emergency Box for convenience, inspection, and maintenance.

III. Miscellaneous (Supplies)

A. Masking Tape, Paper, 2".	3 Roll
B. Masking Tape, Cloth, 2".	3 Roll
C. Plastic Sheeting, 20' x 20'.	2 Sheet
D. Plastic Bag, Small.	1 Box
E. Plastic Bag, Large.	6 Each
F. Radiation Warning Signs.	12 Each

Emergency Equipment Maintained At the AEOF

Item	Quantity
III. Miscellaneous (Supplies) (cont)	
G. File Cards, 3" x 5".	1 Pkg.
H. Radiation Barrier Rope, 200 ft.	1 Coil
I. Smear Papers, 100s.	12 Box
J. Radiation Warning Tape.	1 Roll
K. Pad, Paper, 8 1/2" x 11".	6 Each
L. Pad, Paper, 5" x 8".	6 Each
M. Pencils, Lead.	6 Each
N. Pencils,. Grease Type, Red.	6 Each
O. Stapler with Staples	1 each
P. Envelopes, Manila, 3" x 5", 100s.	2 Each
Q. Clipboards.	2 Each
R. Hand Lantern, Battery Type.	3 Each
S. Flashlight, Battery Type.	2 Each
T. Sets of Batteries for Hand Lantern.	3 Sets
U. Sets of Batteries for Flashlights.	2 Sets
V. Flares, Railroad Type	6 Each
W. Pocket Knife.	1 Each
X. Small Hand Tool Kit with Straight Slot Screwdriver, Phillips Screwdriver, Small Pliers, and Small Vise Grip.	1 Each
Y. Scissors, Blunt Point, 6".	1 Each
Z. Shovel.	1 Each
AA. Complete Copy of CNS Emergency Plan and EPIPs	2 Each

Emergency Equipment Maintained At the AEOF

Item	Quantity
III. Miscellaneous (Supplies) (cont)	
BB. Vials, 5 ml.	12 Each
CC. Pipette with Rubber Bulb.	12 Each
DD. Liter Bottle.	6 Each
EE. Step Off Pads	2 Each
IV. Emergency Decontamination Equipment and Supplies	
A. 55 Gallon Radwaste Barrels With Lids	3 Each
B. Disposable Coveralls	50 Each
C. Vinyl Examination Gloves, 25 Pair/Box	2 Boxes
D. 2" Masking Tape	3 Rolls
E. 3' X 1' X 5' Poly Bag.	12 Each
F. 8" X 10" X 24" Poly Bag.	36 Each
G. 54" X 15", 3-Ring, Vinyl Swimming Pool	4 Each
H. Tire Pump	1 Each
I. Plastic Buckets	4 Each
J. Bars Ivory Soap, Motel Size	24 Each
K. Bath Towels, Disposable	120 Approx.
L. Applicators, Cotton Tipped (100/pkg.)	2 Pkgs.
M. Poly. Sheeting (20' X 100' X 0.006")	1 Roll
N. Health Physics Procedure 9.1.6 Personnel Decontamination	6 Copies
O. Potassium Permanganate	6 Vials
P. Instructions for making the 4% solution of Potassium Permanganate.	1 Set

Emergency Equipment Maintained at the AEOF

Item	Quantity
Q. Sodium Bisulfite	6 Vials
R. Titanium Dioxide	3 Jars
S. Alkanox	2 Cans
T. Tide, Detergent Soap	1 Box
U. Septisol (Germicide)	1 Can
V. Lanolin	1 Jar
W. Swabs, Cotton Tipped, 100s	3 Pkgs.
X. Compresses, Gauze, 3" x 3", 100s	2 Pkgs.
Y. Towels, Paper	1 Roll
Z. Beaker, Plastic 100 ml.	3 Each
AA. Hand Brush	10 Each
BB. Thyroid Blocking Tablets	700 Bottles
V. First Aid and Rescue Equipment	
A. First Aid Kit	1 F
VI. Additional Equipment and Reference Documents	
A. State Emergency Response Plans (Nebraska, Missouri, Kansas, Iowa)	1 Each
B. Local Emergency Response Plans (Nemaha, Richardson, Otoe Relocation Plan, Nebraska EPZ Evacuation Study, and Atchison Counties)	1 Each
C. Emergency Plan and Complete Set of EPIP's, Emergency Telephone Directory	2 Each

Emergency Equipment for Ambulance

Item	Quantity
A. Dosimeter, Direct Reading (0-200 mR).	10
B. Dosimeter Charger.	2
C. TLD Badge.	20
D. Geiger-Mueller Survey Meter.	1
E. Ion-Chamber Survey Instrument	1
F. Radiation Tags.	10
G. Plastic Sheeting.	1 Roll
H. Dosimeter Log Sheets.	3
I. Smear Supplies.	1 Box
J. Health Physics Procedure 9.6.2, Portable Beta-Gamma Counting Instrument.	1
K. Scaler Electronic Package (MS-2) with Pancake Type Detector and Sample Holder.	1
L. High Band Frequency 2-Way Radio	1

Emergency Equipment Maintained at Hospital

Item		Quantity
A.	Radiation Barrier Rope.	1 Roll
B.	Masking Tape.	2 Rolls
C.	Absorbent Paper	1 Roll
D.	Plastic Sheeting	1 Roll
E.	Waste Container (Liquid and Sol.).	1 Each
F.	Applicable Radiation Warning Signs.	6 Each
G.	Shoe Covers, Plastic.	10 Pair
H.	Shoe Covers, Cloth.	10 Pair
I.	Bags, Plastic (Large).	10 Each
J.	Bags, Plastic (Small).	10 Each
K.	Radiation Marking Tape.	1 Roll
L.	Coveralls (Anti-C)	2 Pair
M.	EPIP 5.7.24 - Medical	5 Copies

Emergency Vehicles Maintained at CNS

Item		Quantity
A.	Window Van (4WD) "Surburban" with high band radio - for emergency/environmental use only.	1
B.	Pickup Truck (4WD) 3/4 Ton with high band radio.	1
C.	Pickup Truck (2WD) 3/4 Ton.	1
D.	Station Wagon - Ambulance with high band radio - for medical use only.	1
E.	Automobile - Sedan* with high band radio	5

* Vehicles normally driven by Station Superintendent and Department Supervisors.

I. PURPOSE

To specify the procedures for communicating with various Federal, State and Local authorities, emergency assistance teams, and other offsite support groups.

II. DISCUSSION

The emergency response staff has available to it various types of communications equipment which allows for effective communications to both onsite and offsite groups.

Required notification of offsite groups is accomplished as outlined in EPIP 5.7.6, "Notification". Communications with onsite or offsite groups is the responsibility of the Emergency Director, through the cognizant individual in each emergency response facility. The basic philosophy is to minimize outside distractions to the Emergency Director so he can devote full attention toward controlling the emergency situation. A log of each significant incoming message and appropriate reply is recorded and retained.

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev. 1

IV. PREREQUISITES

None

V. LIMITATIONS

None

VI. PRECAUTIONS

None

VII. EQUIPMENT

A. Lincoln Telephone & Telegraph PBX General Telephone Model GTD 120A, with twelve two-wire E&M trunks to the Brownville Central Office.

B. Station Intercom System

C. Alternate Emergency Intercom System

D. ENS Hotline to the NRC

E. HPN Hotline the NRC

F. NPPD Microwave Network

G. Two local telephones to the Brownville Central Office

H. One in-state wats line.

I. Two FM radio nets, one with an encoder for alerting pageboy monitors

J. NAWAS telephone

K. Hotline to the Nebraska State EOC and Nebraska State Patrol (NSP) headquarters.

IV. PROCEDURE

Communication equipment located in each Emergency Response facility is outlined in Attachment B.

The following paragraphs are intended to provide a quick reference for utilization of any CNS communications equipment.

A. Onsite Communications

1. A Lincoln Telephone and Telegraph PBX is utilized in the CR, TSC, OSC, EOF, and other site areas. This system serves as the primary onsite communications facilities. The extension numbers are contained in the Emergency Telephone Directory.

2. Gaitronics Intercom System.

This single channel, general intercom system is utilized for communications throughout the station. To operate, depress the paging button; this allows the announcement to be heard throughout the station. Releasing the paging button allows the called party to answer, and a normal two-way conversation can be conducted.

3. ITT Intercom System (Bone Fone)

There are two (2) separate channels on the phone. If the small red light is blinking, both channels are being used. A steady red light indicates that your unit is activated.

In order to initiate a call, depress the two access numbers. A tone will be heard each time a digit is depressed. If the number depressed is busy, a rapid intermittent beeping tone will be heard.

o - open When this switch is in the closed position the handset is used to talk. When receiving a call the phone will buzz intermittently for 20 seconds.

When this switch is in the open position one may talk without using the handset. When receiving a call only one (1) buzz will be heard. This switch should normally be placed in the open position.

>< If you are using the handset but want to talk hands-free, depress the + button while you hang up. After completing the conversation, you must hit the cancellation button (+). To change from hands-free to handset during a conversation, simply pick up the handset.

+ If the phone is used with the switch in the open position, or you switched from the handset to hands-free during the conversation, the cancellation button, +, must be depressed after the call is terminated.

0 All call digit. To talk to each station simultaneously depress the digit 0. This is normally used for general announcements only when the other phones are being monitored. The other stations cannot talk back to you, nor can they hear the all call signal if they are already using their units.

0 This button signifies the executive override which can only be used by the unit located in the control room. If the unit you are trying to contact is busy, depress the executive override button, 0, to cut in on the conversation. When the executive override is being used, everyone on the phone will hear a faint intermittent tone.

GENERAL REMINDERS

1. If the phone is used with the switch in the open position (hands-free), the cancellation button, +, must be depressed after terminating the call. If the switch is in the closed position (handset) the call is automatically cancelled when you hang up.

2. If the all call button, "0" is used, the people at the other end will not be able to talk back to you until you hang up and they initiate a call using normal procedures.

B. Offsite Communications

1. A Lincoln Telephone and Telegraph PBX is utilized in the CR, TSC, OSC, EOF, and other plant site areas. This system serves as the primary offsite communications facility. By dialing

"9" on any of the PBX stations, the user is connected into the commercial telephone network via twelve, two-wire trunks. The telephone numbers of emergency response facilities and personnel are contained in the Emergency Telephone Directory.

NOTE: Four extensions, two of which are common to the TSC and EOF, are equipped with emergency bypass capabilities. If the PBX should lose AC power, these extensions automatically connect to the Brownville Central Office. When this happens, the extensions are operated as any other telephone in Brownville. Telephone numbers in Brownville are merely dialed, numbers outside the Brownville area are dialed using the normal toll call "long distance" procedure.

In the event that total failure of the commercial PBX system should occur, alternate methods of communications can be effected through utilization of the other facilities. Use of the private line from the computer room, the private line from the security building, the low band radio equipment, etc. Worst case situation would be calling via one of the above facilities to relay messages on to a point which cannot be contacted directly.

2. One outward WATS line- This circuit is for communications within the State of Nebraska only. It is accessed through the PBX switchboard operator during normal working hours. When the switchboard is closed down, the line may be accessed by dialing 75, 112, (Area Code) and then the telephone number.

   Backup communications facilities for this line are provided by the commercial telephone system, and to a limited extent by the microwave network.

3. Emergency Notification System (ENS)[1] - Lifting the handset accomplishes automatic ringing at the NRC Headquarters in Bethesda, MD.

   Alternate communications to the NRC Headquarters is provided by the Health Physics Network, and the commercial PBX extensions which also have emergency bypass capabilities as explained in B-1 above.

4. Health Physics Network (HPN)[1] - Both the NRC Regional Headquarters and the Health Physics Headquarters may be reached by dialing; dial 22 for Health Physics Headquarters, dial 23 for NRC Region Headquarters. The red light, which is located on the telephone, when illuminated, indicates the line

Note [1]: If the handset is replaced and the user wishes to reconnect to the system, he must wait approximately 20 seconds prior to lifting the handset.

is busy; the white light, located on the west wall of the Computer Room, when illuminated, indicates the line is inoperative.

Backup for this network is provided by the commercial PBX extensions which also have emergency bypass capabilities as explained in B.1 above.

5. Microwave Telephone Network - This NPPD Private Switching Network is accessed by dailing "74" on any of the commercial telephone extensions. When the dial tone is heard, the desired telephone number may be dialed. The General Office in Columbus may be reached on this network. The desired telephone numbers are found in the Emergency Telephone Directory.

   Backup communications for this network are provided by the commercial telephone system and the WATS line.

6. One private line located in the conference room of the security building (EOF). This line is out of the Brownville Central Office. Any direct calls to Brownville are local, while others are made using normal toll call "long-distance" procedures.

7. One private line located in the computer room. This line is out of the Brownville Central Office. Again, any direct calls to Brownville are local, while others are made using normal toll call "long-distance" procedures.

8. National Warning System (NAWAS) - This party-line network is operationally controlled by attack warning officers at the National Warning Centers of the Federal Emergency Management Agency (FEMA). Lifting the handset connects to the system. The push-to-talk button on the inside face of the hand-set must be pressed to transmit. Because it is a party line, conversations should be of a short duration. Detailed instructions for use of this network are posted near the telephone set located in the Control Room.

9. Hotline to Nebraska State EOC and NSP - This hotline is in the Control Room, and when activated will connect CNS to both offsite authorities (NOTE: State EOC is manned between 8 A.M. to 5 P.M. weekdays, NSP on a 24-hour/day basis). To activate this hotline simply pick up the handset; the receiving party will answer. If during normal working hours and the contact is with Civil Defense, request NSP to hang up, Civil Defense should answer. If other than normal working hours, request NSP dispatcher to contact Civil Defense Duty Officer. NSP will answer on a 24-hour basis.

10. FM Radio Networks

a. RADIO UTILIZATION

Efficient radio utilization can only be accomplished through strict compliance with correct operating procedures. Therefore, some of the major "do's" and "don'ts" are listed below:

(1) BE BRIEF AND CONCISE (Think before speaking)

(2) UNNECESSARY REPETITION - No messages (other than orders and reports required to be repeated back, such as switching orders and reports) shall be repeated. However, the party receiving the message may ask for a repetition of any part of the order not understood.

(3) ACKNOWLEDGEMENT - When a message is clearly understood, it shall be acknowledged by the code signal (10-4). (Message received and understood.)

(4) ORDERS AND REPORTS - The terminology for operating orders and reports shall be consistent with operation department instructions and forms for reporting or recording of data.

(a) Avoid preliminary discussion over the radio of prearranged work.

(b) Restrict discussion of work done to details which are actually needed at the moment for the safe operation of equipment and personnel.

(5) TROUBLE CALLS - Give name, address and type of trouble. Party receiving message shall acknowledge but not repeat the information.

(6) TROUBLE REPORTS - Reports of trouble found and progress of clearing it may be given but only if needed to decide further action.

(7) MATERIAL AND INFORMATION REQUESTS - These shall be restricted to items actually needed at the time and shall not be repeated back.

(8) WORK ASSIGNMENTS - Work assignments shall not include detailed plans and information unless work is of an emergency nature so that advance planning is not possible.

b. INITIATING AND CLEARING CALLS

(1) Base Stations to Mobile Stations and Other Base Stations - Base stations shall initiate calls and reply to calls from other base and mobile stations by using the District identification assigned to the base station, control point or dispatch points. (Usually the identification will be the name of the town or city at which the base station is located.)

Examples:

Initiating a call to a mobile station "Cooper Station to 400"

Initiating a call to another base station "Cooper Station to Northport"

Replying to a call from another base station "Go ahead Cooper"

Base stations shall reply to a call from a mobile station by simple acknowledgement Go ahead 400"

After an exchange of transmissions is terminated, the base station shall sign off with its "station call". This identifies the station as required by the FCC Rules and also indicates that the operator is ready for calls from other stations.

(2) Mobile Stations to Base Stations - Mobile stations must identify the base station, control point or dispatch point being called by the District identification assigned.

Example: "154 to O'Neill"

After an exchange of transmissions is terminated with a base station and the base station has transmitted its "station call", the mobile station must transmit its group mobile "station call" followed by the District identifying number assigned to the vehicle.

Example: "KUW955 - 154

This identifies the station as required by the FCC Rules and also indicates the message has been received and understood.

c. MOBILE AND BASE STATION OPERATION CONTROLS

(1) RECEIVER VOLUME CONTROL

(a) The receiver or control unit volume control shall be regulated to keep the level high enough so that incoming signals may be identified.

(2) SQUELCH CONTROL

(a) This control is provided to quiet the receiver when no signal is being received.

(b) To operate the squelch control, turn the control knob until a loud rushing noise is heard in the speaker, then turn the control in the opposite direction until the rushing noise just disappears. Do Not turn the control beyond this point or weak signals will not be heard.

(3) INDICATOR LIGHTS - BASE AND MOBILE STATIONS

(a) Green Light - When the green light is illuminated, it indicates that the radio equipment is energized in a standby or receive position.

(b) Red Light - When the red light is illuminated, it indicates that the transmitter is "on". This indication should occur only when the "push to talk" button on the microphone is pressed.

Warning - Should the red light be illuminated when the "push to talk" button is not pressed it indicates that the transmitter is on. This is a malfunction and should either be corrected immediately or the equipment removed from service. A transmitter left in the "on" or "transmit" position will "block" receivers in its transmitting area and render them incapable of receiving other stations.

d. RANGE AND RELIABILITY OF MOBILE COMMUNICATIONS -

Mobile units will be affected by such factors as:

(1) Maintenance condition of the radio unit and/or the vehicle and/or the associated base station.

(2) Terrain and location of mobile unit with respect to base stations of various power outputs and antenna height.

(3) Weather conditions including temperature inversions causing "skip interference" from distant stations.

"Black cloud" effect. This is a "loose" description of a condition wherein atmospheric conditions create an electrical charge on a base station antenna, particularly those on steel towers, which desensitizes the base station receiver to the point that it has little or no receiving capability for the duration of the condition. (This condition will also affect point to point operation of base stations.)

Precipitation and dust static also reduce receiver capability.

(4) Electrical Power Lines and Equipment - Such equipment may induce sufficient voltage into nearby antennas to desensitize the receiver, particularly in weak radio signal areas.

Move the vehicle away from power lines and equipment when difficulty is experienced in establishing mobile communications in the immediate area of such lines or equipment.

(5) Vehicle Electrical System Interference -The electrical system of the vehicle in which the mobile radio unit is installed may create sufficient interference to seriously hamper the ability of the receiver to function properly, particularly in areas of weak base station transmitter signal.

It may be necessary under extreme conditions to turn off the ignition on the vehicle to receive a weak radio signal.

IX. ATTACHMENTS

Attachment A, "Radio Code Signals"
Attachment B, "Emergency Response Facility Communication Equipment"

RADIO CODE SIGNALS

A. The use of Radio Code Signals is recommended whenever their use will convey the desired intelligence with less time, words, or confusion, than normal conversation technique.

B. These signals are few in number and can be easily memorized. Their use is recommended to enhance operating procedures and reduce "on the air" time.

Radio Code Signals - N.P.P.D. Form K-52

10-1 Unable to receive
10-2 Receiving well
10-3 Stop transmitting
10-4 Message received and understood
10-5 Relay message
10-6 Busy (stand-by)
10-7 Out of servi e
10-8 In service
10-9 Repeat
10-10 Away from Radio can be reached at _____
10-11 Call this station by telephone
10-13 Advise weather and road condition
10-19 Return to your base of operation
10-20 What is your location / mine is _____

Phone System		OSCs			EOF/ AEOF	TSC	Control Room	Security	Comments
		HP	Mech Maint	I&C Elec					
A.	Lincoln Telephone & Telegraph PBX-General Telephone Model GTD 120A, 12 Two-Wire E&M trunks to Brownville Central Office	X	X	X	X	X	X	X	Offsite Dial "9" Primary onsite/offsite communications
B.	Station Intercom System "Gaitronics"	X	X	X	X	X	X	X	Other outlets available in various areas throughout the station.
C.	Alternate Emergency Intercom System "Bone Phone"	X	X	X	X	X	X		Two separate channels per phone-sml red lite blinks when in use.
D.	ENS Hotline to NRC Headquarters Bethesda, MD				X	X	X		NRC Headquarters Bethesda, MD
E.	HPN Hotline NRC Regional & HQ				X	X			Dial 22 for NRC Headquarters; Dial 23 for Regional NRC Headquarters
F.	NPPD Microwave Network General Office	X	X	X	X	X	X	X	Dial 74 on any commercial telephone General Office Columbus
G.	Two local telephones to Brownville Central Office				X				The second telephone is in computer room
H.	One in-state wats line through PBX	X	X	X	X	X	X	X	When switchboard is closed down access thru 75-112 (Area Code) and number
I.	Two FM radio nets (7) with encoder for alerting pageboy monitors			X	X	X	X		
J.	NAWAS telephone						X		
K.	Hotline to Nebraska State EOC and Nebr. State Patrol (NSP)				X	X	X		
L.	Sound Powered Phone					X	X		Other outlets available in various areas throughout the station

NOTE: An intercom system is available within TSC.

I. PURPOSE

The purpose of this procedure is to prescribe those recovery operations necessary to (1) identify the extent of station damage and radiological contamination (if any) and (2) return the station to an operating status which is in compliance with the Technical Specifications.

II. DISCUSSION

As indicated in the CNS Emergency Plan, recovery operations will occur in two phases. Phase I activities are performed by the emergency response organization and are designed to (1) terminate the emergency, (2) mitigate or eliminate potential hazards to the public and station personnel, and (3) restore the station to a safe and stable condition.

Phase II recovery operations, which are addressed in this procedure, include the longer term efforts required to return the station to a normal operating status following damage associated with a major emergency. While such damage could occur under an ALERT classification, it is anticipated that Phase II recovery operations would be needed only in the event of a SITE AREA EMERGENCY or a GENERAL EMERGENCY.

III. REFERENCE MATERIAL

A. CNS Emergency Plan

B. NUREG 0654, Rev 1

C. NUREG 0737

IV. PREREQUISITES

A. Radiation levels are stable or decreasing with time.

B. Releases of radioactive materials to the environment have ceased or are controlled within permissible license limits.

C. Fire, flooding, or similar emergency conditions no longer constitute a hazard to the station or station personnel.

D. Measures have been successfully instituted to correct or compensate for malfunctioning equipment.

V. LIMITATIONS

None

VI. PRECAUTIONS

A. Following any emergency involving radiological hazards, exposure to personnel should be kept as low as reasonably achievable consistent with the nature of the recovery operation required.

B. Recovery operations commence with the station in a controlled, stable condition. No action is to be taken which might perturb this situation without the approval of the Recovery Director.

VII. EQUIPMENT

Recovery operations will be performed using existing station equipment (which includes the post accident sampling system) to the maximum extent possible. Special and/or additional equipment will be obtained when required to complete the recovery operation in a safe and efficient manner.

VIII. PROCEDURE

A. Determination of Station Damage and Contamination

1. Initial Station Survey

a. For known or suspected significant station damage, and at the discretion of the Recovery Director, survey teams will be formed consisting of Operations, Engineering, Maintenance, and Health Physics personnel.

b. These teams, following pertinent guidance contained in EPIP 5.7.15, "Rescue and Reentry", will perform an organized search of the station to ascertain the extent of physical damage and areas of contamination/high radiation. The results of these surveys will be used by the Recovery Director and the Radiological Controls Manager in planning the detailed surveys described below.

2. Detailed Station Surveys

a. Using the information obtained above, the Radiological Controls Manager will dispatch properly equipped Health Physics Technicians to perform detailed surveys of any areas known to contain radiological hazards. Each area shall be posted and barriers shall be erected. Station Radiological Survey Maps will be used to record the boundaries of these areas. Station Chemists may be dispatched to take and analyze a post accident sample should conditions dictate. Provisions have been made to take and analyze coolant and containment samples within three hours of the time a decision is made that samples are required.

b. Under the Recovery Director, the Technical Support Manager will evaluate any physical damage found and analyze pertinent station instrumentation to ascertain what station systems/components are inoperable and, if possible, the cause. Detailed lists of this information will then be generated and made as specific as possible.

B. Repair, Modification, and Decontamination

1. Planning

a. Under the direction of the Recovery Director, pertinent recovery organization members, as well as selected offsite personnel, will address the planning and coordination of the recovery effort. Such activities as the repair and maintenance of existing station system/components, modification, installation, and decontamination, as well as determining the need for portable shielding and special procedures will be discussed, prioritized, and planned.

b. The Scheduling/Planning Manager will develop an overall schedule to guide the recovery effort.

2. Training

a. In consideration of the situation to be handled, special training material will be developed and training conducted for special work tasks to the maximum extent.

3. Recovery Implementation

a. Upon definition of the problems to be faced, finalization of the overall recovery plan, development of any special procedures, and allocation of adequate repair equipment and properly trained personnel; actual recovery operations will begin. In lieu of any special requirements in place at the time, normal station practices will be followed concerning maintenance, repair, modification, decontamination, and personnel exposures control.

b. During the recovery operation, the Radiological Controls Manager will periodically estimate total population exposure, in coordination with state and federal authorities.

c. As the recovery operation proceeds, any unforeseen problems which are encountered will be evaluated and factored into the recovery plan. The schedule will then be adjusted accordingly.

d. Upon completion of the recovery effort, Technical Specification compliance will be verified prior to recommencing normal station operations.

IX. ATTACHMENTS

None

I. PURPOSE

The purpose of this procedure is to describe the Early Warning System (fixed and mobile systems) within the emergency planning zone of Cooper Nuclear Station. This system was set up to meet prompt notification requirements required for Cooper Nuclear Station. It was also designed for response to any disaster, fire, flood, tornado, etc., where prompt notification to the public is desirable.

II. DISCUSSION

The Early Warning System consists of two types of sirens, fixed and mobile. This balance of fixed and mobile sirens was chosen on the basis that the fixed sirens would cover areas of high population density and that the mobile sirens would cover areas of low population density, thus providing maximum coverage.

A. Fixed Sirens.

The fixed siren system is composed of nine pole mounted sirens located in or near the following towns:

1. Nebraska:

   a. Peru - 1 siren in town.

   b. Brownville - 1 siren in town.

   c. Nemaha - 1 siren in town.

   d. Shubert - 1 siren in town.

2. Missouri:

   a. Watson - 1 siren near town.

   b. Rock Port - 1 siren in town.

   c. Phelps City - 1 siren in town.

   d. Langdon - 1 siren near town.

   e. Nishnabotna - 1 siren near town.

These fixed sirens are Federal Signal Corporation Thunderbolt sirens capable of producing 125 db of sound in any of three sound patterns.

B. Mobile Sirens.

The Mobile Siren System is comprised of mobile units following designated routes around the fixed siren population centers. Mobile sirens have been provided to each volunteer fire department within these areas to cover the number of routes specified below.

1. Nebraska:

   a. Peru - 4 routes.

   b. Brownville - 4 routes.

   c. Nemaha - 4 routes.

   d. Shubert - 2 routes.

2. Missouri:

   a. Rock Port - 7 routes.

   b. Watson - 4 routes.

In addition, the Richardson and Nemaha County Sheriff's personnel will also have designated notification routes.

See Attachment "D" for maps of the designated routes.

The mobile sirens are Whelen Engineering Company Model 370 PA speakers coupled to a Whelen WS-295 power amplifier. These sirens are capable of producing four distinct sounds at a sound level exceeding 70 db.

III. REFERENCE MATERIAL

A. CNS Emergency Plan.

B. NUREG 0654, Rev. 1.

C. CNS Emergency Planning Information Hand Out.

IV. PREREQUISITES

A. Prompt notification to the public is deemed necessary for implementation of a protective action guide. This will normally be determined by state and local authorities in accordance with their respective Nuclear Power Plant Emergency Response Plans. The CNS Emergency Director will recommend protective actions to these authorities in accordance with EPIP 5.7.20, Protective Action Guides, or in severe situations, may activate the Early Warning System in accordance with EPIP 5.7.6, Notification.

V. LIMITATIONS

A. The fixed and mobile siren system, in addition to its use as a means of prompt notification in the event of an incident at Cooper Nuclear Station requiring a protective action, may be used to warn the public of attack, tornado, flood, fire, or any disaster requiring prompt notification to the public.

VI. PRECAUTIONS

A. The siren systems are to be used only in the event of emergencies or testing.

VII. EQUIPMENT

A. Nine fixed sirens located in the following population centers:

1. Nebraska:

a. Peru - 1 siren in town.

b. Brownville - 1 siren in town.

c. Nemaha - 1 siren in town.

d. Shubert - 1 siren in town.

2. Missouri:

a. Rock Port - 1 siren in town.

b. Watson - 1 siren near town.

c. Phelps City - 1 siren in town.

d. Langdon - 1 siren near town.

e. Nishnabotna - . siren near town.

B. Mobile sirens in the following fixed siren locations with at least the number of mobile sirens equal to the number of mobile siren routes. Normally spare mobile sirens will be maintained at each location:

1. Nebraska:

a. Peru - 4 routes with 3 mobile units mounted on fire trucks and 2 universal mount mobile siren units within the Fire House.

b. Brownville - 4 routes with 3 mobile units mounted on fire trucks and 2 universal mount mobile siren units within the Fire House.

c. Nemaha - 4 routes with 1 mobile unit on a fire truck and 4 universal mount mobile siren units within the Fire House.

d. Shubert - 2 routes with 2 mobile units within the Fire House.

e. Nemaha County Sheriff - 2 routes with 3 mobile units mounted on Sheriff's Department vehicles.

f. Richardson County Sheriff - 1 route with 1 mobile unit mounted on Sheriff's Department vehicle.

2. Missouri:

a. Rock Port - 7 routes with 4 universal mount mobile siren units stored within the Fire House and 3 units installed on fire vehicles. In addition, 7 mobile units are installed on privately owned Volunteer Firemen's vehicles.

b. Watson - 4 routes with 1 universal mount mobile siren unit within the Fire House and 3 units installed on fire vehicles. In addition, 3 mobile units are installed on privately owned Volunteer Firemen's vehicles.

c. Although the Atchison County Sheriff has no designated routes, 3 mobile units are mounted on the Sheriff's Department vehicles, should assistance be required.

VIII. PROCEDURE

A. Fixed Sirens.

1. Activation.

a. Activation of the fixed sirens will be accomplished by the County Sheriff in the county which the siren is located:

1) Nemaha County Sheriff activates the fixed sirens in Peru, Brownville, and Nemaha.

2) Richardson County Sheriff activates the fixed siren in Shubert.

3) Atchison County Sheriff activates the fixed sirens in Rock Port, Watson, Phelps City, Nishnabotna, and Langdon

b. The Sheriff will be requested to sound the fixed sirens in their respective area by the local and state emergency response authorities. These authorities will have responded to a Cooper Nuclear Station emergency in accordance with their respective state and local emergency response plans. In a severe situation, the Sheriffs may be requested to sound the sirens by the CNS Emergency Director if immediate protective action is deemed necessary.

2. Testing.

a. Each fixed siren will normally have a growl test at least monthly.

3. Maintenance or repair.

a. If repair of the fixed siren is required, the Cooper Nuclear Station Control Room (402-825-3811 or personnel 825-6811) will be notified and they will initiate necessary repair action, logging, and notification.

Note: See Attachments "A", "B", and "C" for Sheriff's procedure to activate the fixed sirens.

B. Mobile Sirens.

1. Activation.

a. Upon activation of the fixed sirens by the respective County Sheriff, Volunteer Firemen report to their Fire House. This is accomplished in the same manner as when Firemen normally report to the Fire House in response to a fire within the area.

b. The Fire Chief or Senior Firemen will contact the County Sheriff by radio or telephone and request information. If the Cooper Nuclear Station Early Warning System is to be activated, Firemen will place the mobile siren units on vehicles (if not already installed), perform an operational check, and drive the routes as outlined in Attachment "D". Each Fire House has a procedure outlining these steps. Attachments "E" through "L" contain these procedures. Upon completion of the notification routes, the Fire Chief or Senior Firemen will report back to the County Sheriff.

Note: Nemaha County and Richardson County Sheriff personnel also have routes as shown in Attachment "C" and route procedure Attachments "K" and "L".

2. Testing.

   a. Mobile sirens at the Fire Houses will normally be tested during the scheduled Fire Department meetings. See Section VII. for the number of primary units corresponding to the number of routes and the number of standby or backup units at each location.

3. Maintenance or repair.

   a. If a mobile siren is found to be inoperable or in need of repair, the Cooper Nuclear Station Control Room personnel will be notified and then will initiate necessary repair actions, logging, and notification.

IX. ATTACHMENTS

A. Nemaha County Sheriff - Activation Of Early Warning System.

B. Richardson County Sheriff - Activation Of Early Warning System.

C. Atchison County Sheriff - Activation Of Early Warning System.

D. D-1 - Peru Notification Routes.

D-2 - Brownville Notification Routes.

D-3 - Nemaha Notification Routes.

D-4 - Shubert Notification Routes.

D-5 - Nemaha County Sheriff Notification Routes.

D-6 - Richardson County Sheriff Notification Routes.

D-7 - Rock Port Notification Routes.

D-8 - Watson Notification Routes.

E. Peru Volunteer Fire Department - Mobile Siren Procedure.

F. Brownville Volunteer Fire Department - Mobile Siren Procedure.

G. Nemaha Volunteer Fire Department - Mobile Siren Procedure.

H. Shubert Volunteer Fire Department - Mobile Siren Procedure.

I. Rock Port Volunteer Fire Department - Mobile Siren Procedure.

J. Watson Volunteer Fire Department - Mobile Siren Procedure.

K. Nemaha County Sheriff - Mobile Siren Procedure.

L. Richardson County Sheriff - Mobile Siren Procedure.

NEMAHA COUNTY SHERIFF - ACTIVATION OF EARLY WARNING SYSTEM

In the event of an emergency at Cooper Nuclear Station or any civil disaster which may require immediate alerting of people from the towns of Brownville, Peru, and Nemaha, the following procedure will be utilized:

1. Sound the alert sirens in the designated areas (use code near controls to alert individual sirens or all sirens sounded at once).

2. Establish communication with the local Fire Chief in the siren area by telephone or radio (Peru - radio, Brownville - radio, Nemaha - Fire Chief radio or telephone).

3. The Fire Chief will dispatch the Firemen with mobile sirens in predesignated routes. These mobile sirens have public address systems and will alert residents along their routes to tune to the Emergency Broadcast Station.

4. Dispatch two Sheriff Officers to cover the mobile siren routes.

5. The Fire Chief is to report back when the routes have been completed.

6. Once notified by the respective Fire Chief and Sheriff personnel that all Early Warning routes have been completed, the Nemaha County Sheriff will relay this information to the Nemaha County Emergency Operations Center.

Testing: Activate the fixed sirens in Brownville, Peru, and Nemaha at 1200 each Saturday. Contact each community to verify the sirens were sounded. Log this activation and verification of sounding in the Dispatcher's log book. If a siren is found to be inoperable contact Cooper Nuclear Station (825-3811 during normal working hours or 825-6811 during off hours or weekends) and inform the Maintenance Supervisor or the Shift Supervisor of the malfunction.

RICHARDSON COUNTY SHERIFF - ACTIVATION OF EARLY WARNING SYSTEM

In the event of an emergency at Cooper Nuclear Station or any civil disaster which may require immediate alerting of people from the town of Shubert, the following procedure will be utilized:

1. Sound the alert siren in Shubert (use code near controls to activate the siren).

2. Establish communication with the local Fire Chief by telephone (unlisted Fire House telephone number is 883-2758).

3. The Fire Chief will dispatch the Firemen with mobile sirens on predesignated routes. These mobile sirens have public address systems and will alert residents along their routes to tune to the Emergency Broadcast Station.

4. Dispatch one Sheriff Officer to cover Richardson County mobile siren route.

5. The Fire Chief is to report back when the routes have been completed.

6. Once notified by the respective Fire Chief and Sheriff personnel that all Early Warning routes have been completed, the Richardson County Sheriff will relay this information to the Richardson County Emergency Operations Center.

Testing: The fixed siren in Shubert will be activated on a monthly basis in conjunction with the Richardson County Civil Defense Operability Test. Shubert will be contacted to verify that the siren has sounded. Log the activation and verification of sounding in the Dispatcher's log book. This test will be conducted on the last Friday of each month at 4:30 p.m. If the siren is found to be inoperable contact Cooper Nuclear Station (825-3811 during normal hours or 825-6811 during off hours or weekends) and inform the Maintenance Supervisor or the Shift Supervisor of the malfunction.

ATCHISON COUNTY SHERIFF - ACTIVATION OF EARLY WARNING SYSTEM

In the event of an emergency at Cooper Nuclear Station or any civil disaster which may require immediate alerting of people from the towns of Rock Port, Watson, Phelps City, Langdon, or Nishnabotna, the following procedure will be utilized:

1. Sound the alert sirens in the designated areas (use code near controls to alert individual sirens or all sirens sounded at once).

2. Establish communications with the Rock Port and Watson Fire Departments in the siren area by telephone or radio. Watson has a base radio.

3. The Fire Chief will dispatch the Firemen with mobile sirens on preselected routes. These mobile sirens have public address systems and will alert residents along their routes to tune to the Emergency Broadcast Station.

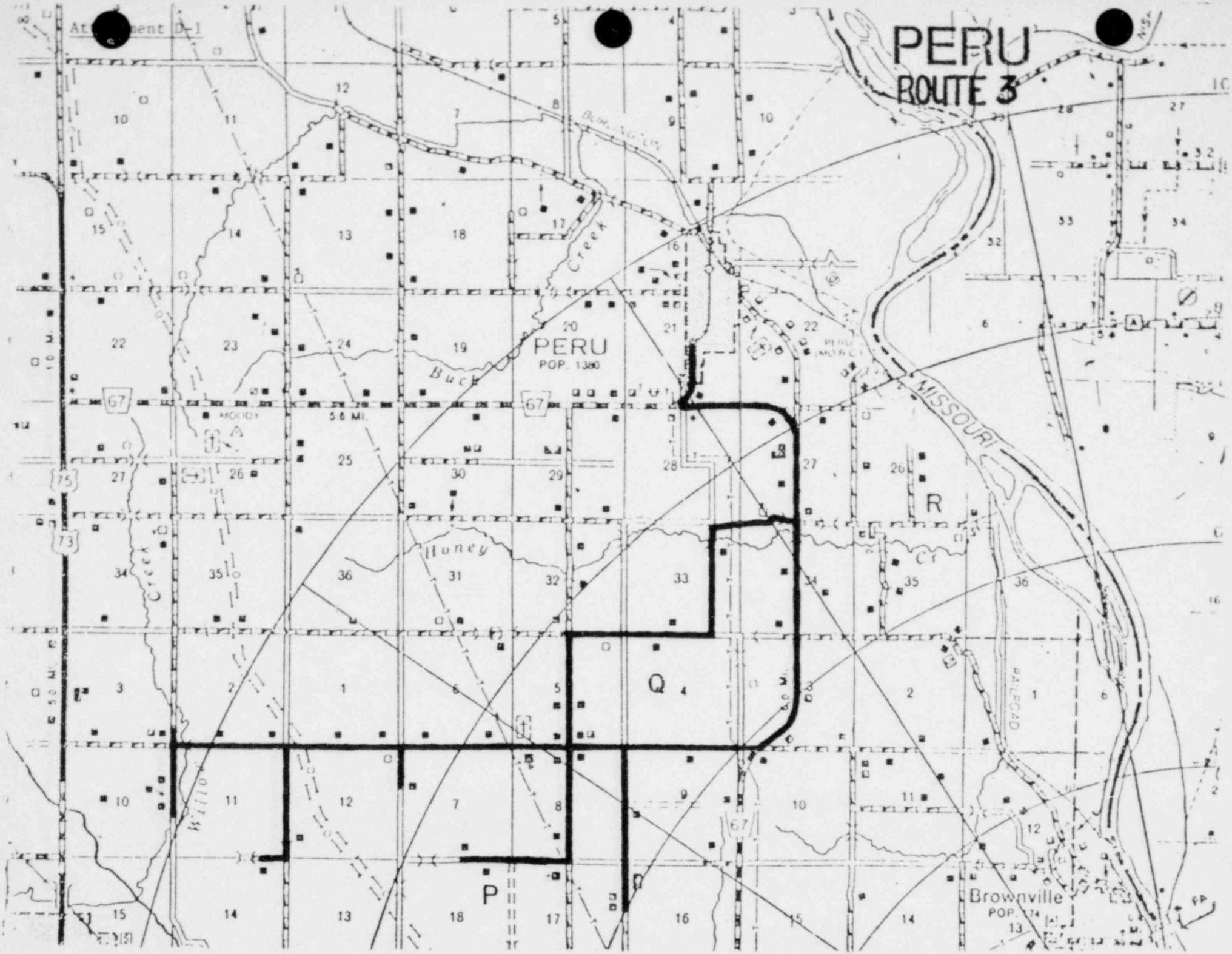
4. The Fire Chief will report back when the routes have been completed.

5. Once notified by the respective Fire Chiefs that all Early Warning routes have been completed, the Atchison County Sheriff will relay this information to the Atchison County Emergency Operations Center.

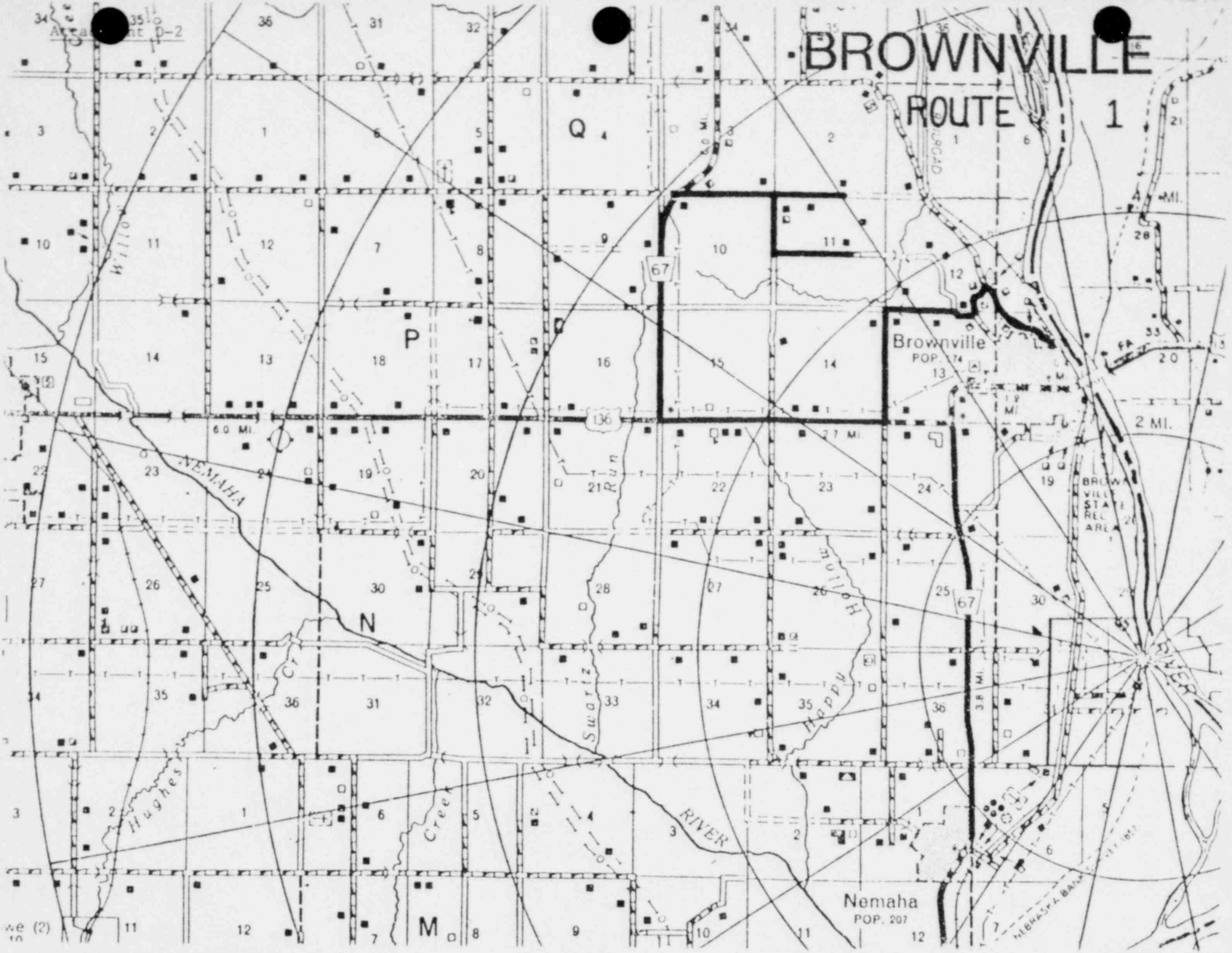
Testing: Activate all fixed sirens at 1200 each Saturday. Contact each community; Rock Port, Watson, Phelps City, Nishnabotna, and Langdon, to verify the sirens were sounded. Log this activation and verification of sounding in the Dispatcher's log book. If a siren is found to be inoperable contact Cooper Nuclear Station (825-3811 during normal working hours or 825-6811 during off hours or weekends) and inform the Maintenance Supervisor or the Shift Supervisor of the malfunction.

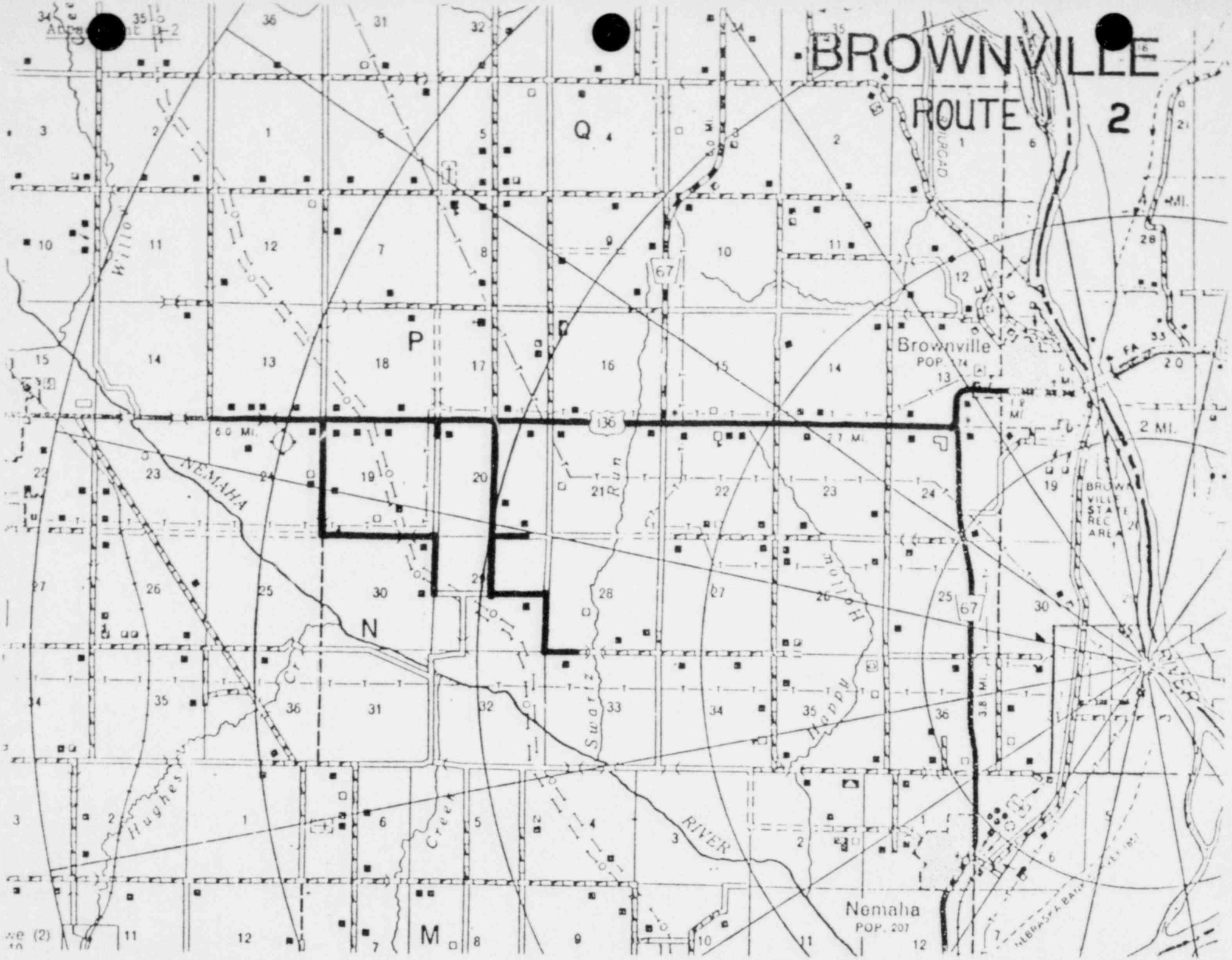

Attachment D-1
PERU
ROUTE 1
PERU
POP. 1380
MISSOURI
Buck Creek
Honey Creek
Brownville
POP. 74
67
75
73
R
Q
P

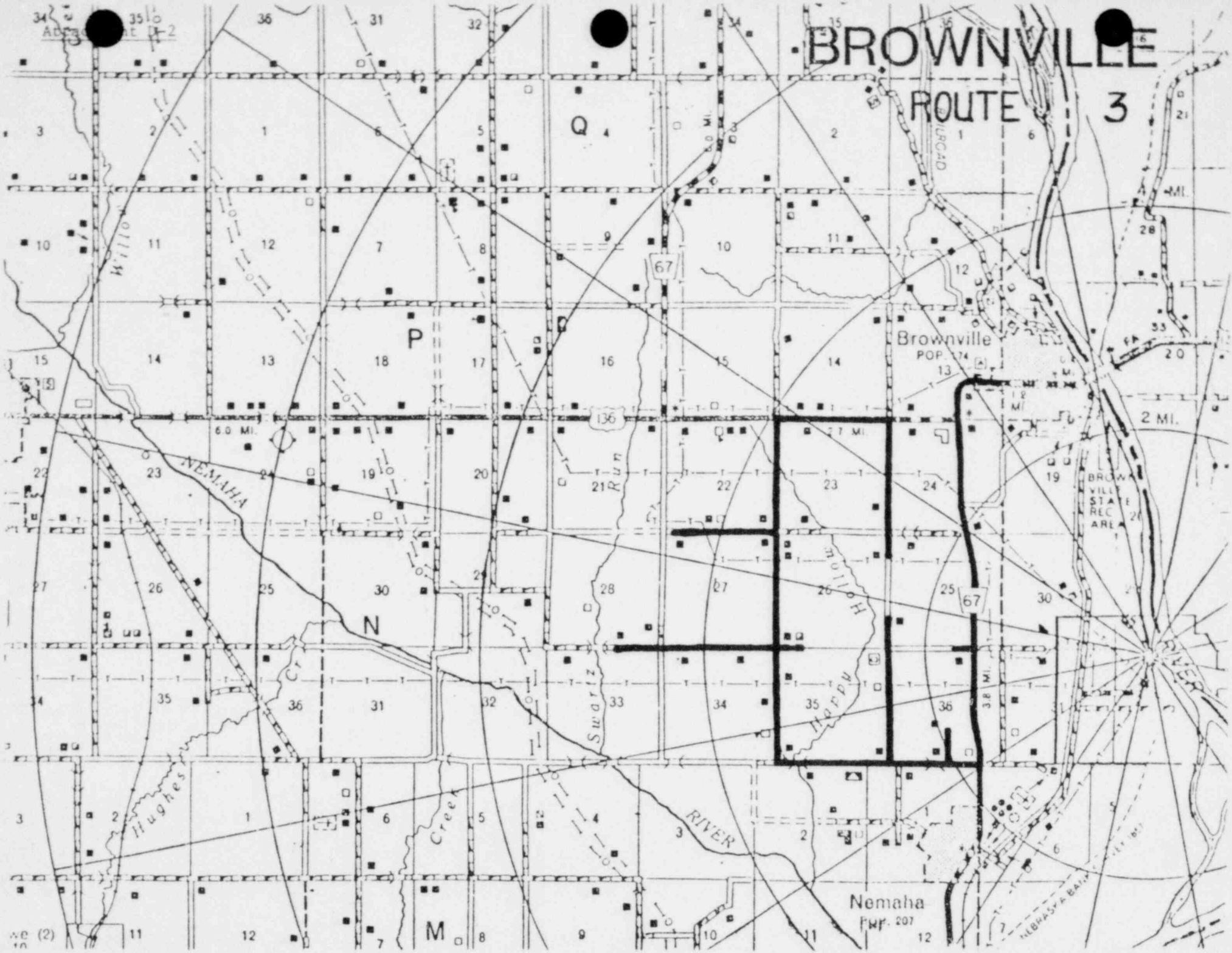

Attachment D-1
PERU
ROUTE 2
PERU
POP. 1380
MOODY
5.6 MI.
MISSOURI
Buck Creek
Honey Creek
Willow Creek
BURLINGTON
PERU (MOORE)
RAILROAD
Brownville
POP. 74
67
75
73
P
Q
R

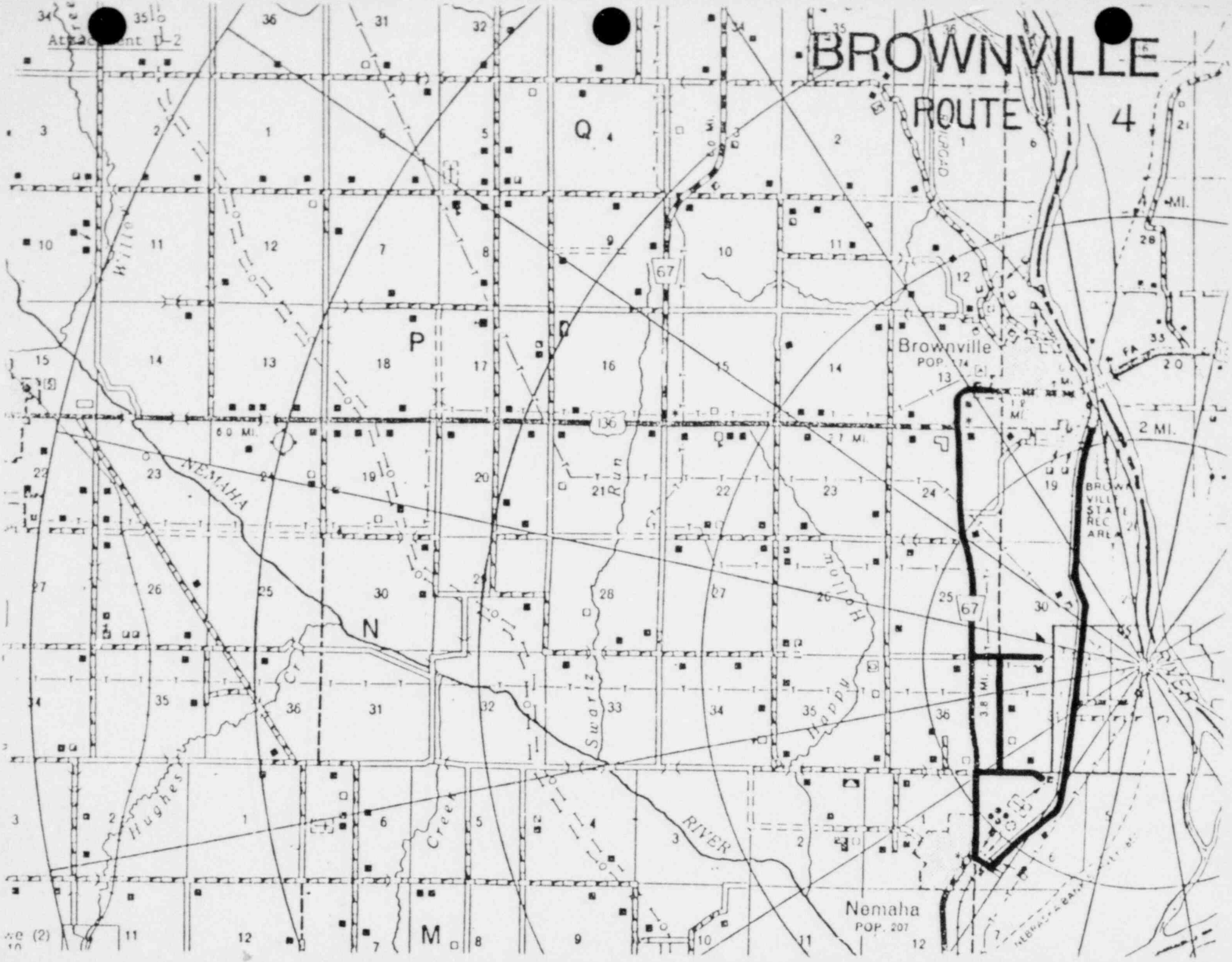

PERU
ROUTE 3
PERU
POP. 1380
MISSOURI
Honey
Creek
Brownville
POP. 174
P
Q
R
67
75
73

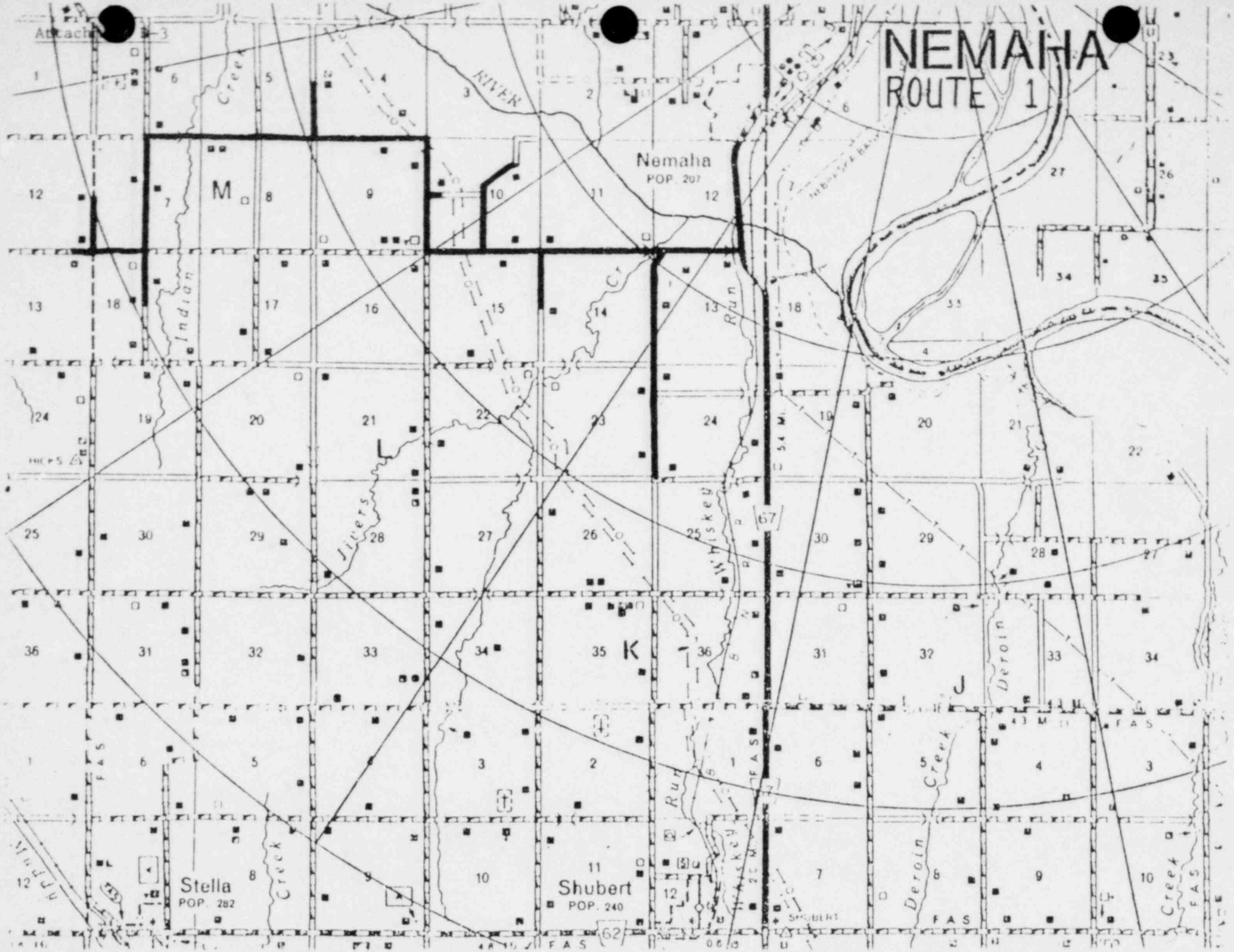

PERU
ROUTE 4
PERU
POP. 1380
MISSOURI
Buck Creek
Honey Creek
Willow Creek
Brownville
POP. 174
R
Q
P
67
73
75

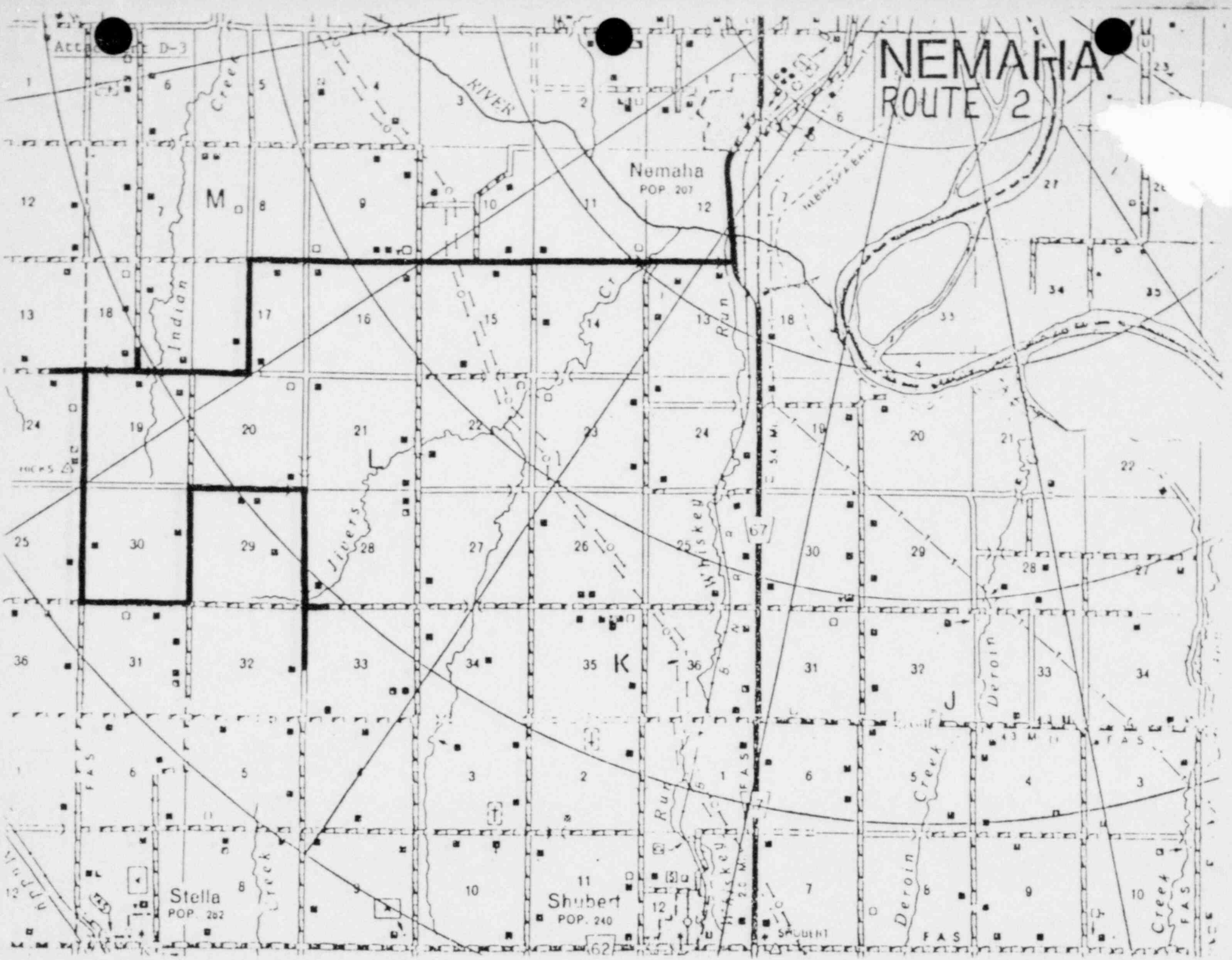

BROWNVILLE
ROUTE 1
Brownville
POP. 174
Nemaha
POP. 207
67
136
Q
P
N
M
6.0 MI.
2 MI.
3.8 MI.
NEMAHA
RIVER
Swartz Run
Hughes Creek
Willow Creek
Mulloh
Happy
NEBRASKA BAND


BROWNVILLE
ROUTE 2
Brownville
POP. 174
Nemaha
POP. 207
136
67
Q
P
N
M
NEMAHA
RIVER
Hughes
Creek
Swartz
Happy
Hollow
2 MI.
6.0 MI.
2.7 MI.
3.8 MI.

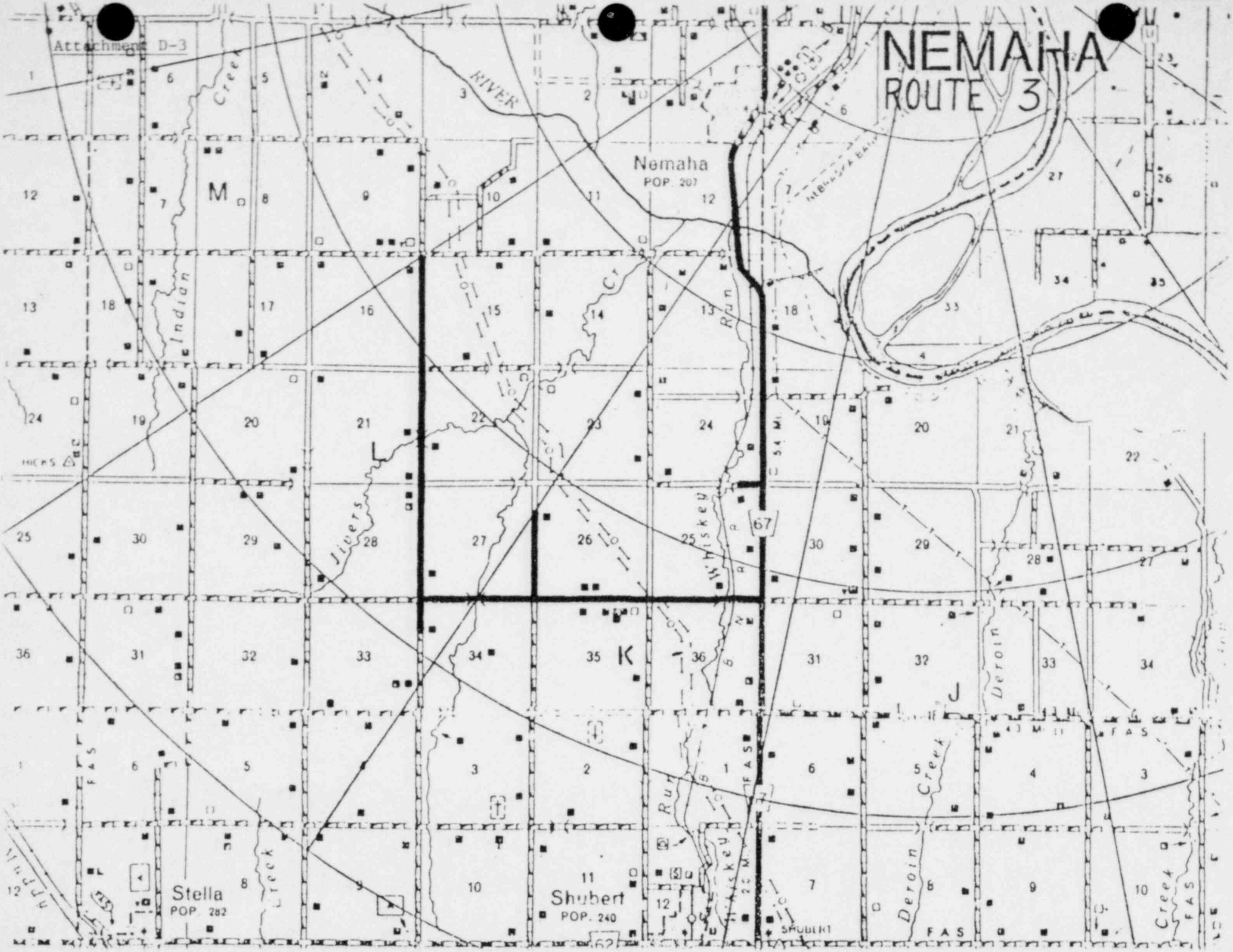

BROWNVILLE
ROUTE 3
Brownville
POP. 174
Nemaha
POP. 207
NEMAHA
Hughes Creek
Swartz Run
Mollie H
Happy
RIVER
67
136
2 MI.
6.0 MI.
3.8 MI.
Q
P
N
M

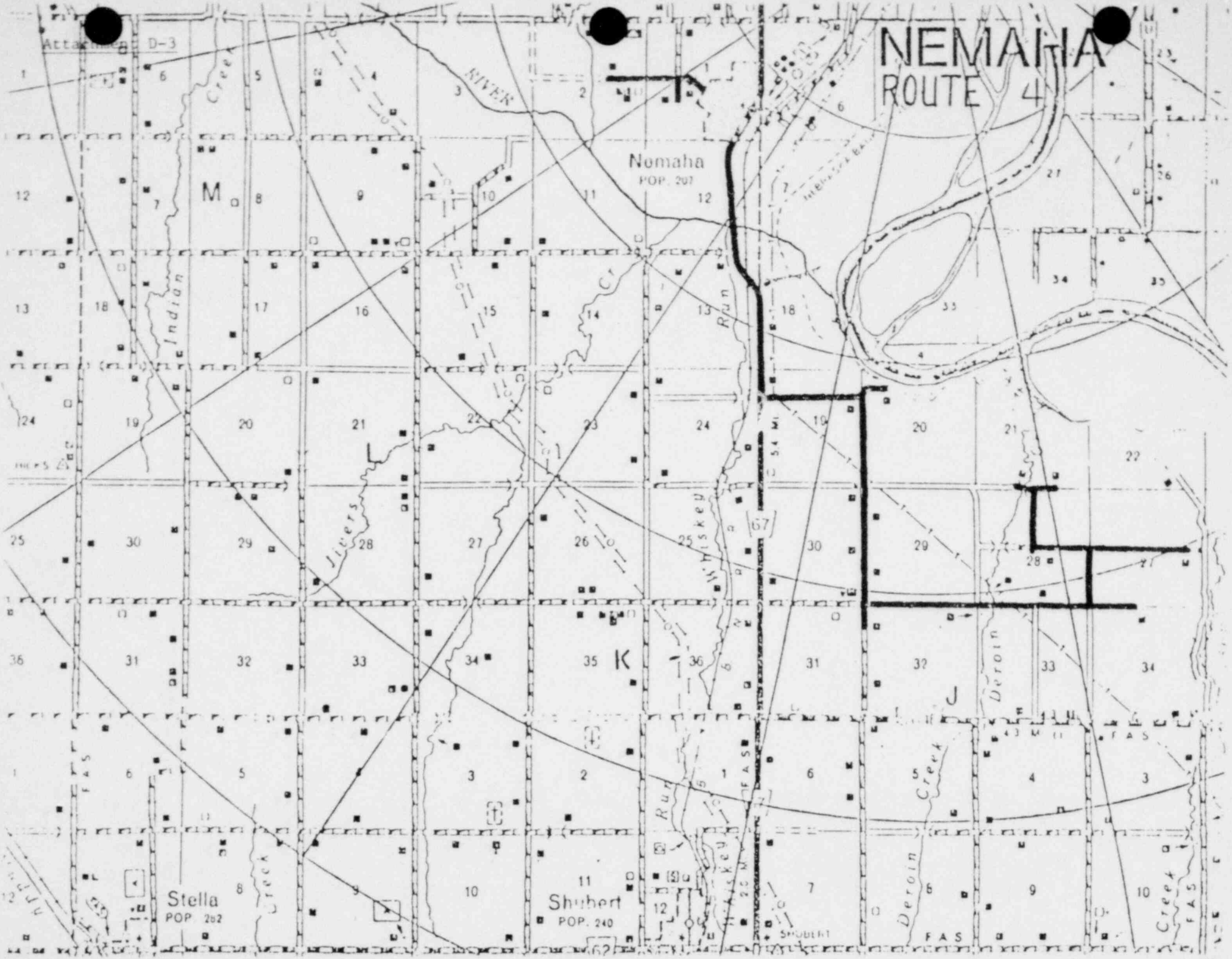

Attachment D-2
BROWNVILLE
ROUTE 4
Brownville
POP. 174
Nemaha
POP. 207
NEMAHA
RIVER
Swartz
Hughes
Creek
Hollow
Happy
BROWNVILLE STATE REC AREA
67
136
2 MI.
3.8 MI.
6.0 MI.
7.1 MI.
P
Q
N
M

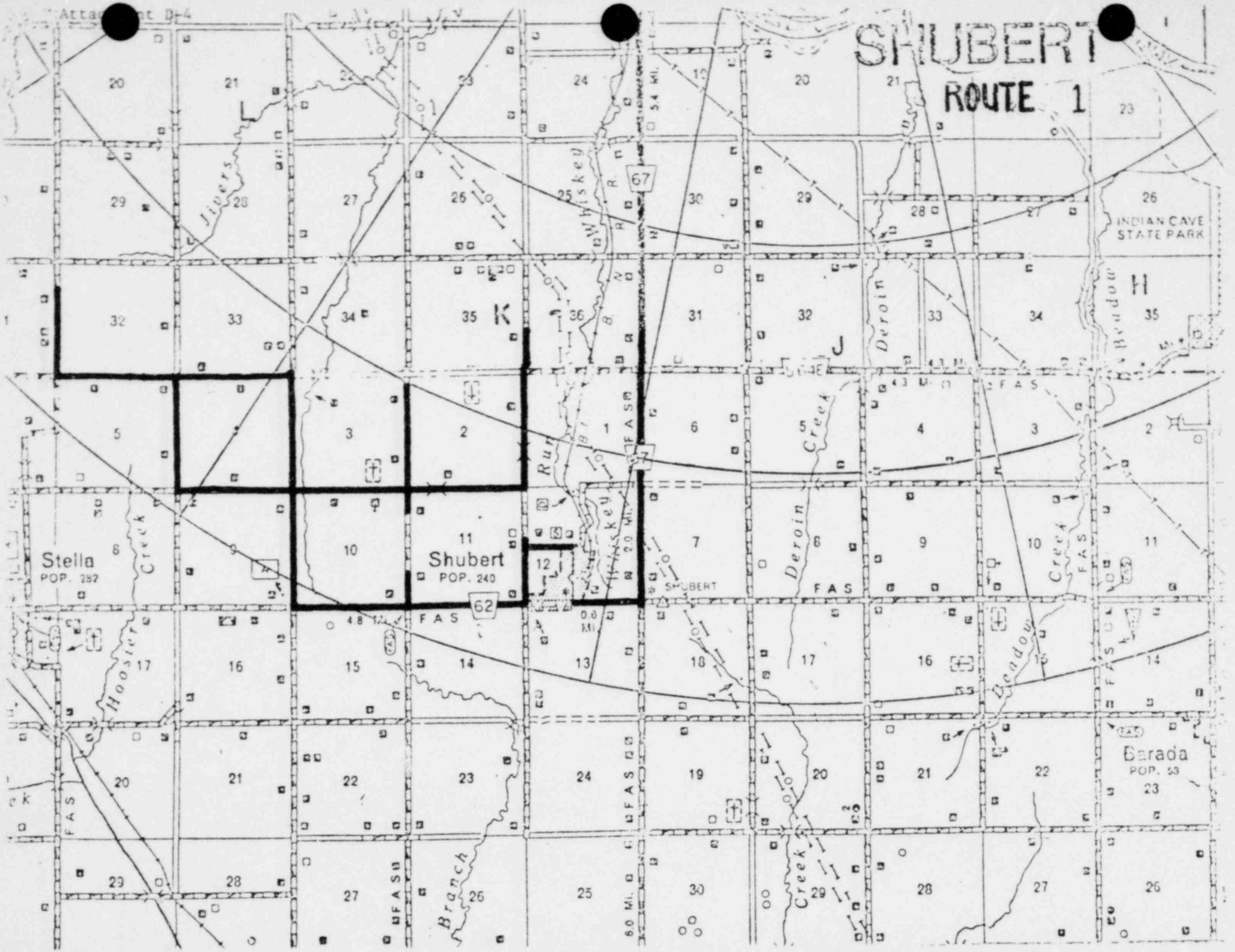

NEMAHA
ROUTE 1
Nemaha
POP. 207
Stella
POP. 282
Shubert
POP. 240
Indian Creek
Jivers Creek
Whiskey Run
Deroin Creek
FAS
67
62


NEMAHA
ROUTE 2
Nemaha
POP. 207
Stella
POP. 262
Shubert
POP. 240
Indian Creek
Deroin Creek
FAS
M
K
J

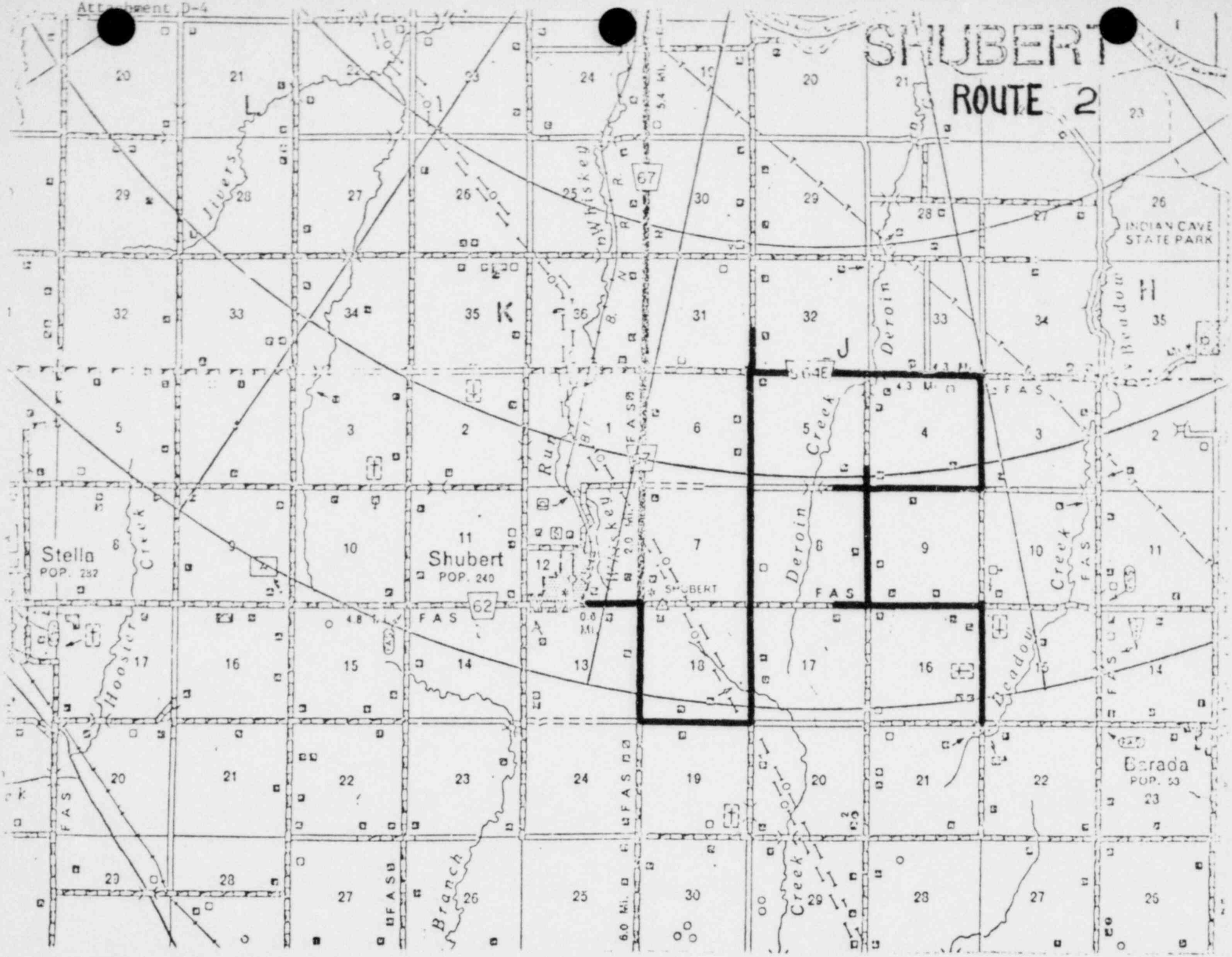
Attachment D-3



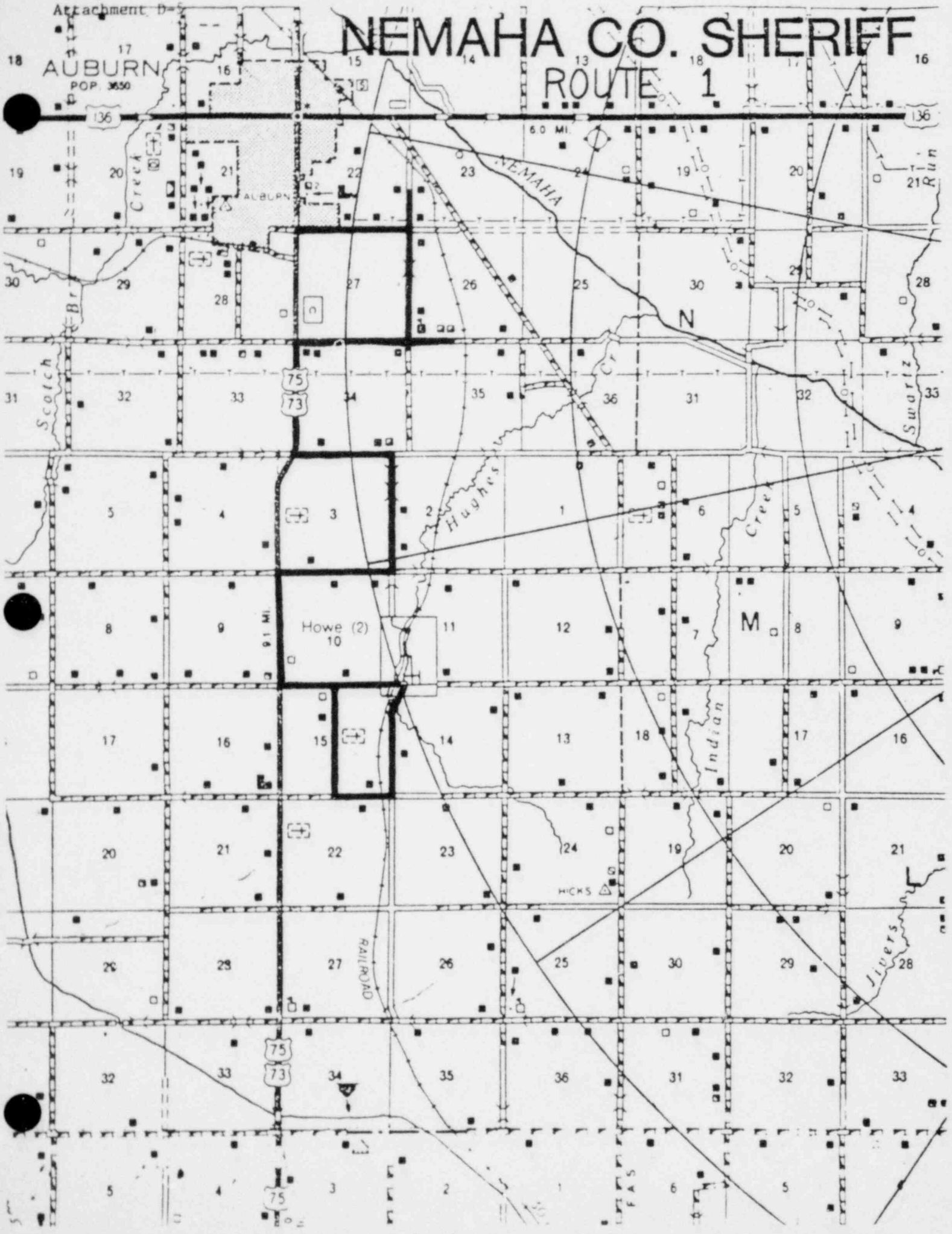

Attachment D-3
NEMAHA
ROUTE 4
Nemaha
POP. 207
Stella
POP. 262
Shubert
POP. 240
Indian Creek
Jivers Creek
Whiskey Run
Deroin Creek
M
K
J
FAS


SHUBERT
ROUTE 1
Stella
POP. 282
Shubert
POP. 240
Barada
POP. 53
INDIAN CAVE
STATE PARK
Whiskey Run Br.
Deroin Creek
Bradour Creek
Hoosier Creek
Branch
FAS
62
67
SHUBERT

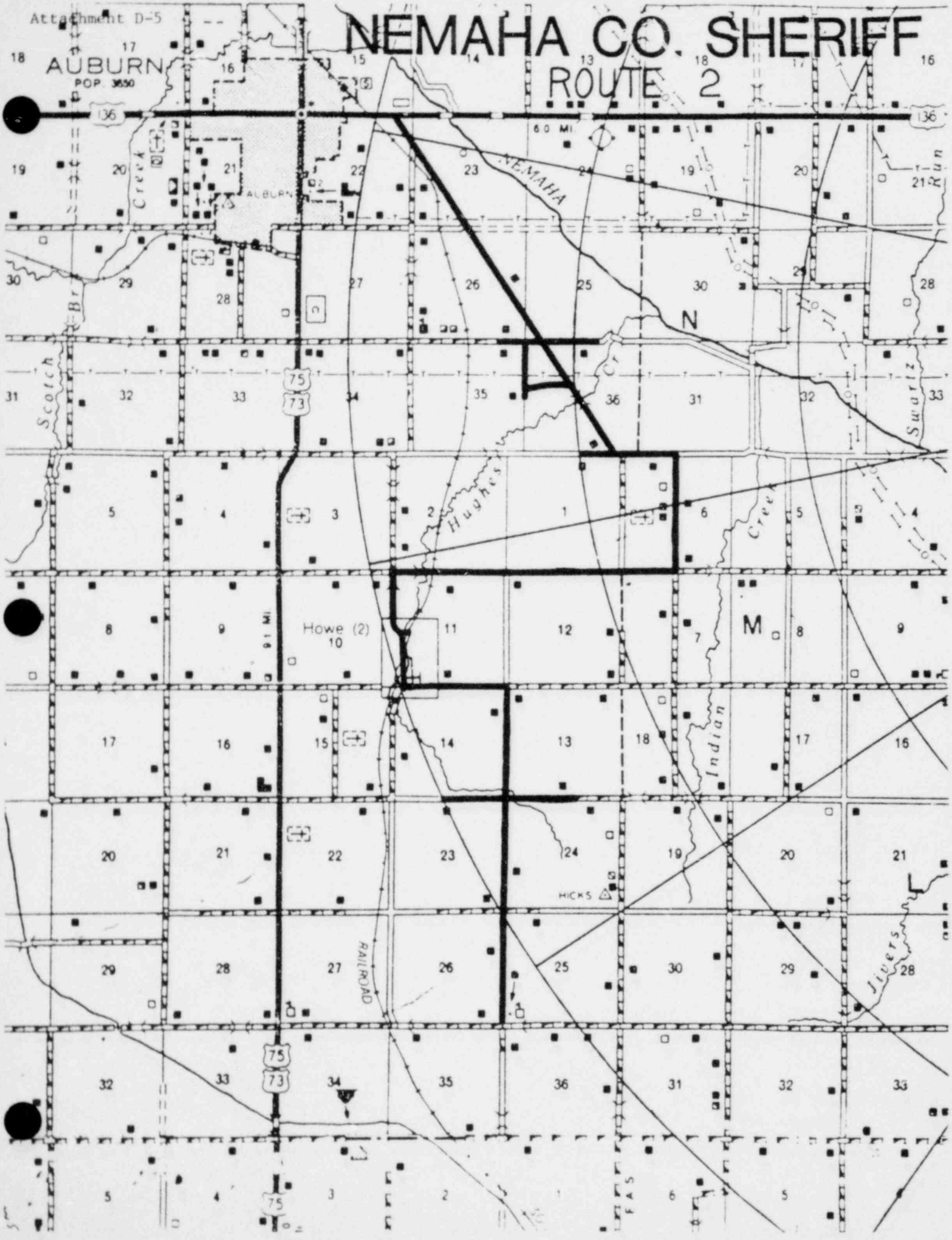
Attachment D-4



Attachment B-5

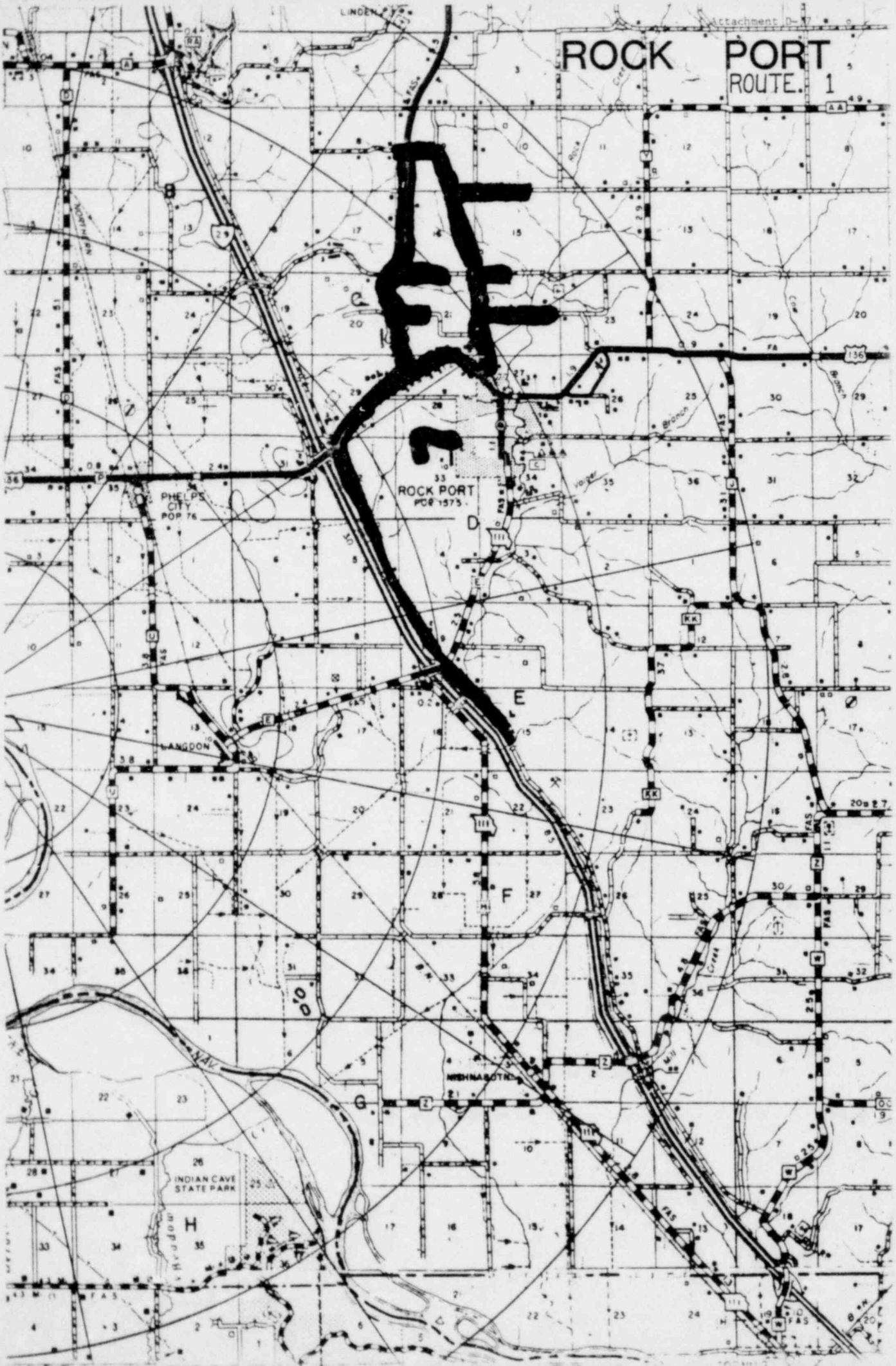


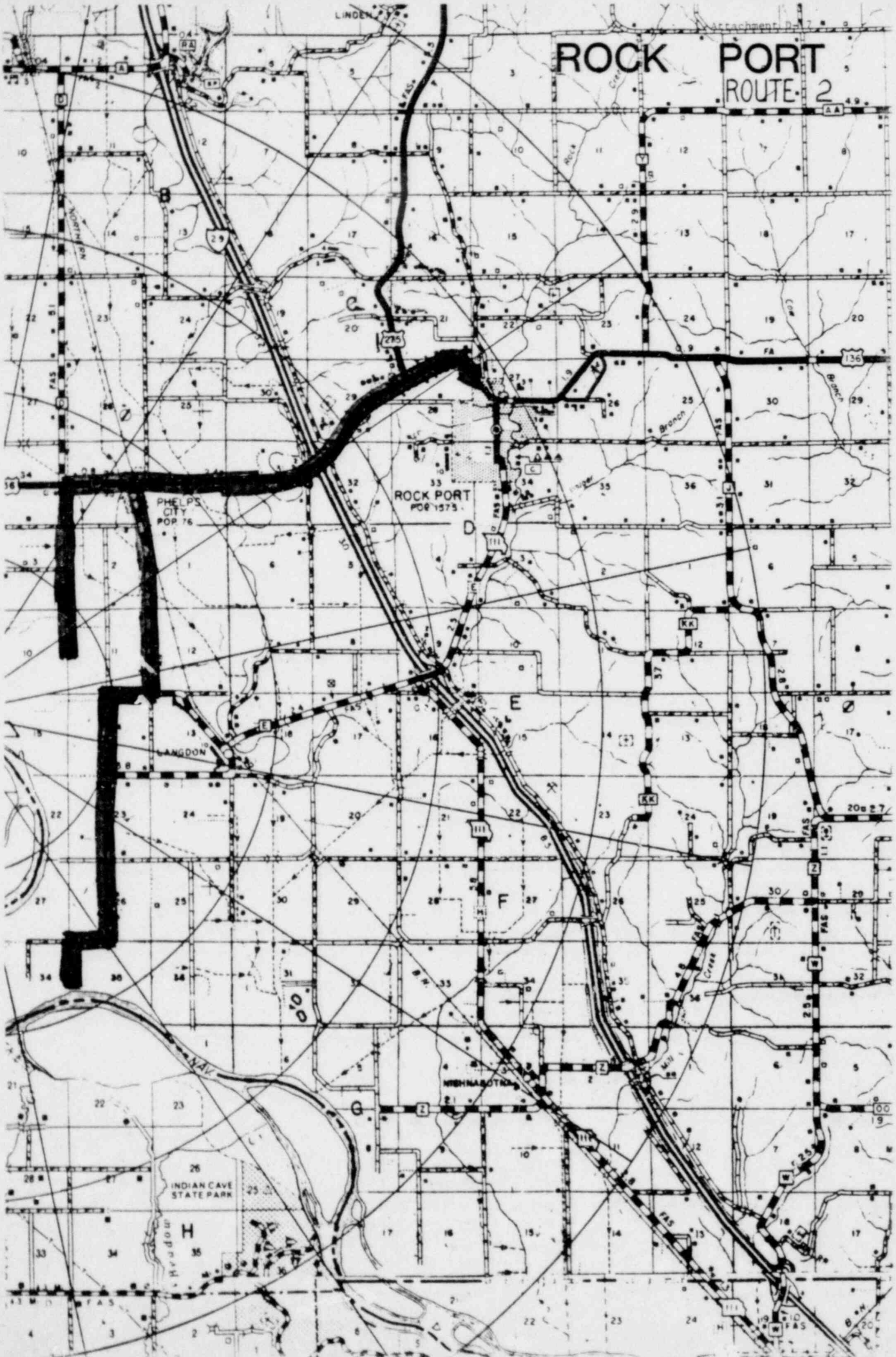
Attachment D-5

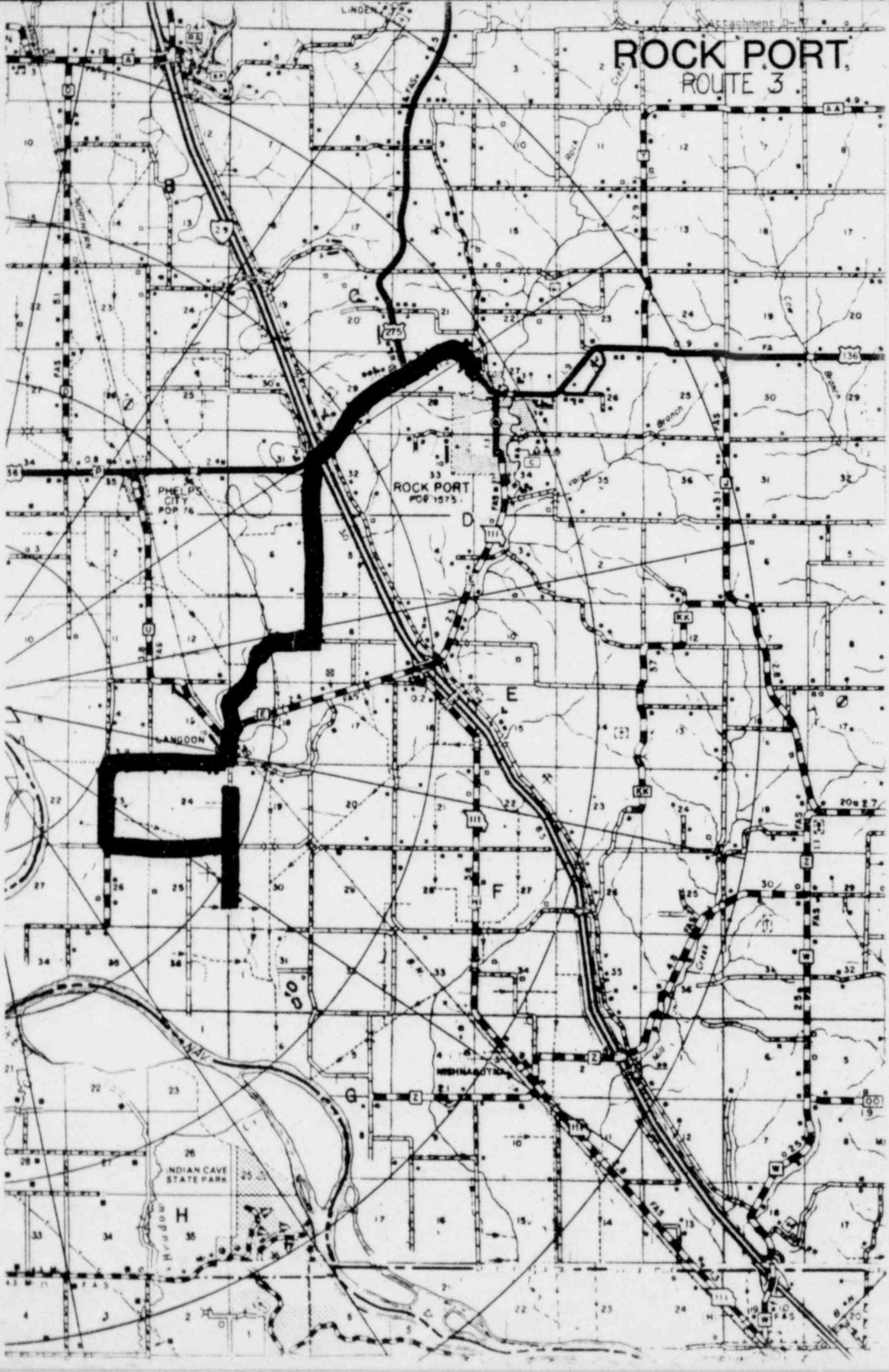


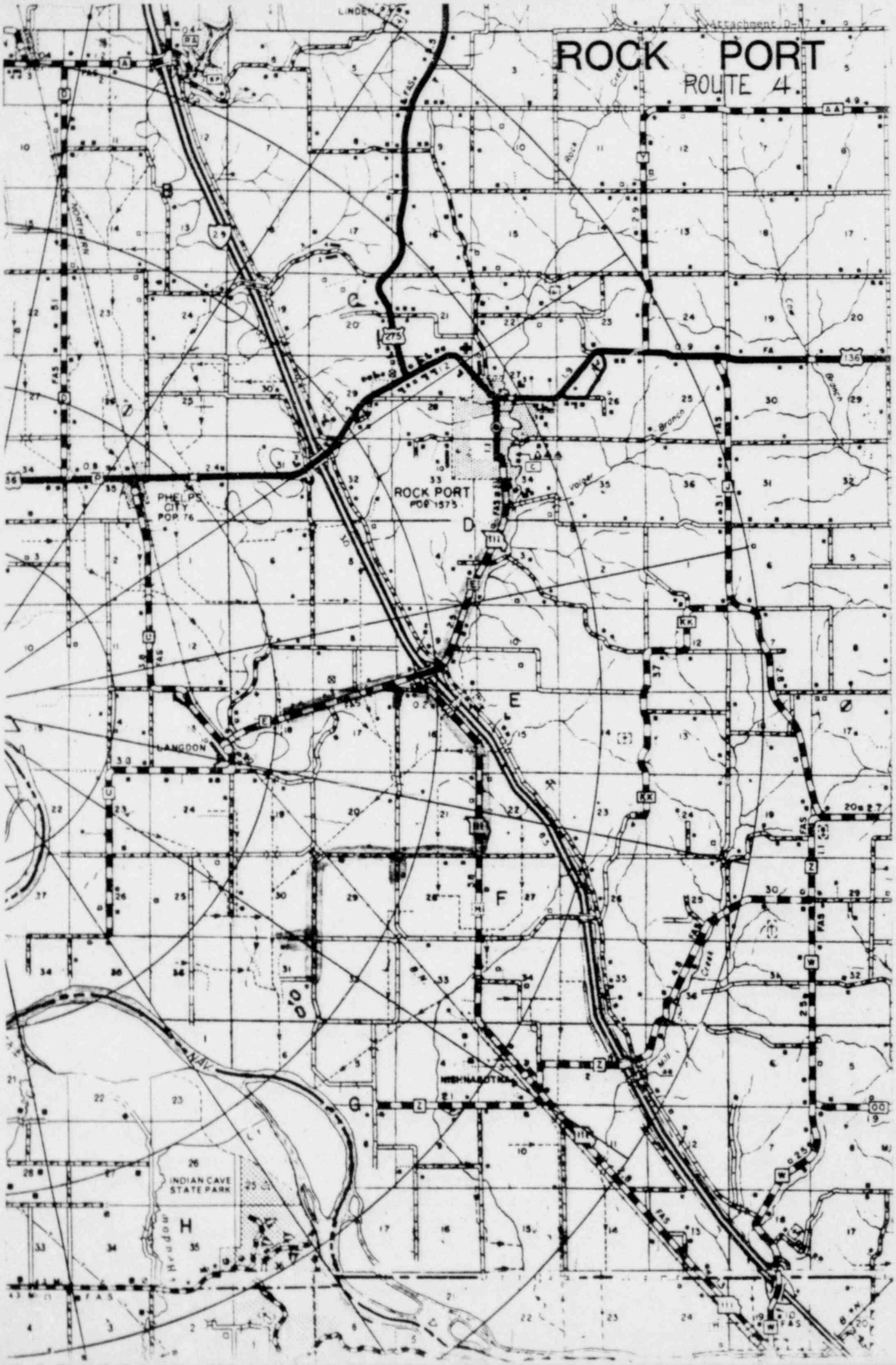
Attachment D-6

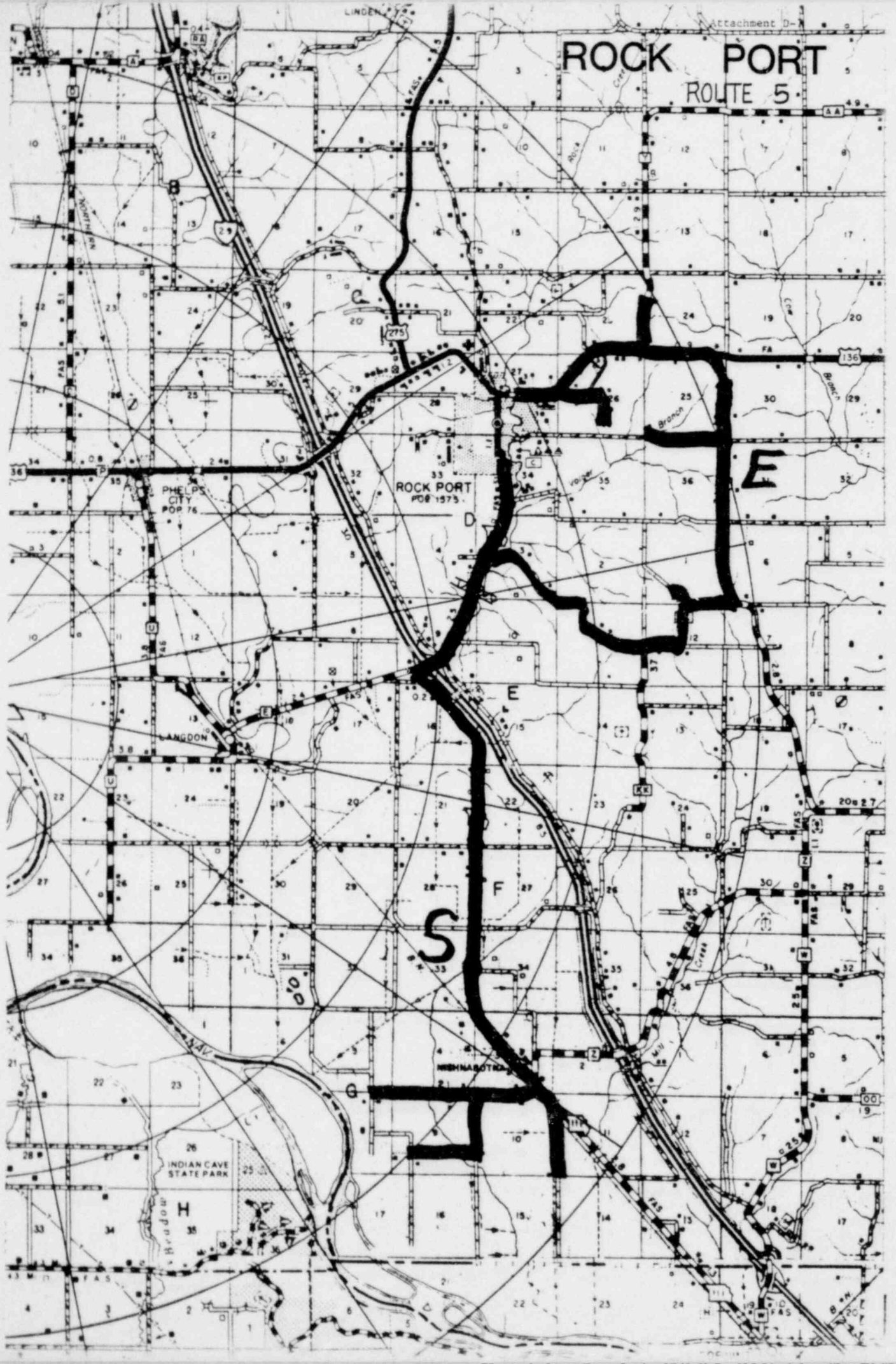
Handled by Richardson County Sheriff Department

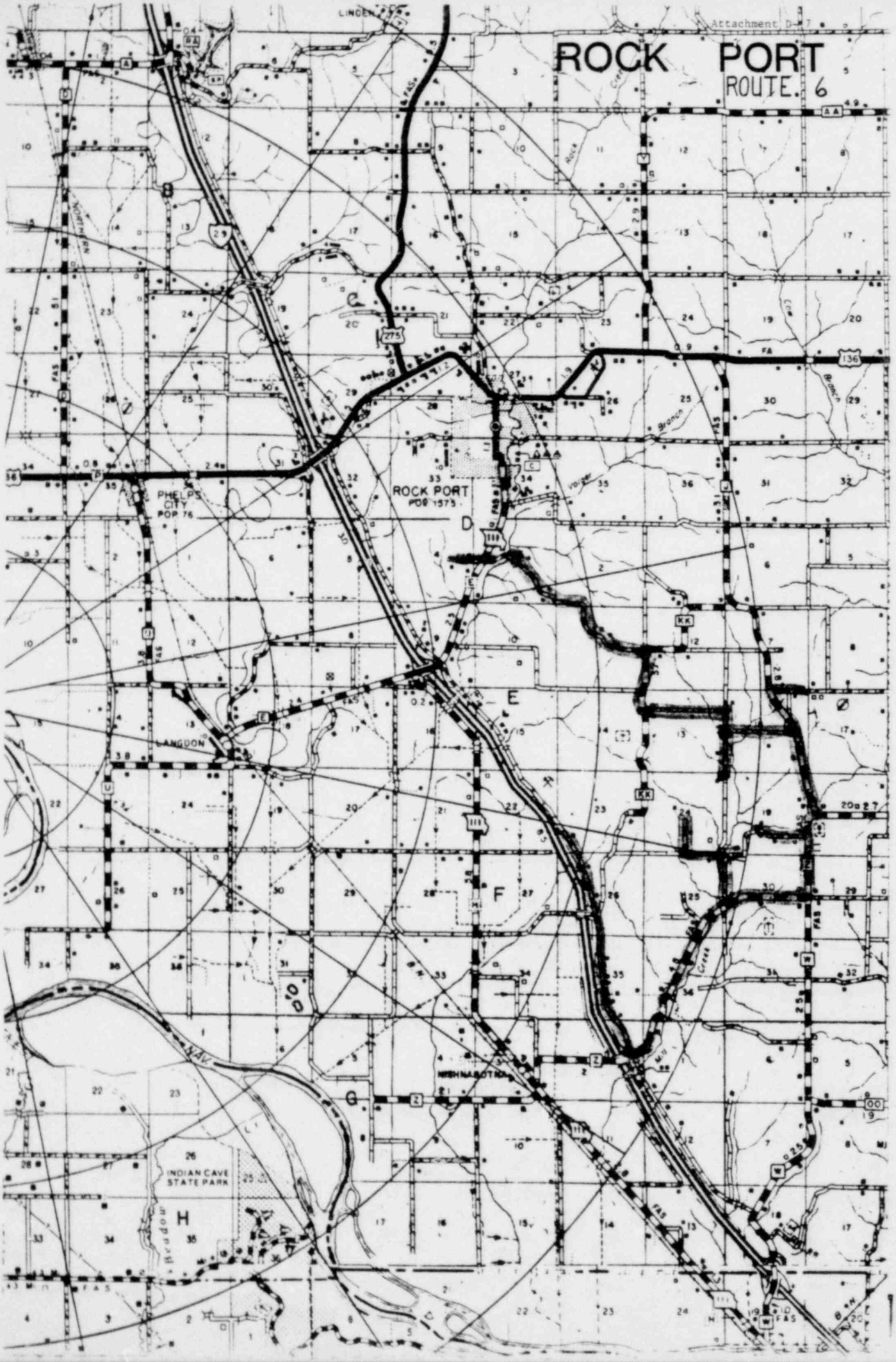

ROCK PORT
ROUTE. 1
ROCK PORT
POP 1575
PHELPS CITY
POP 76
LANGDON
INDIAN CAVE STATE PARK
NISHNABOTNA
Hudson
Branch
Creek
Mill
A
B
C
D
E
F
G
H

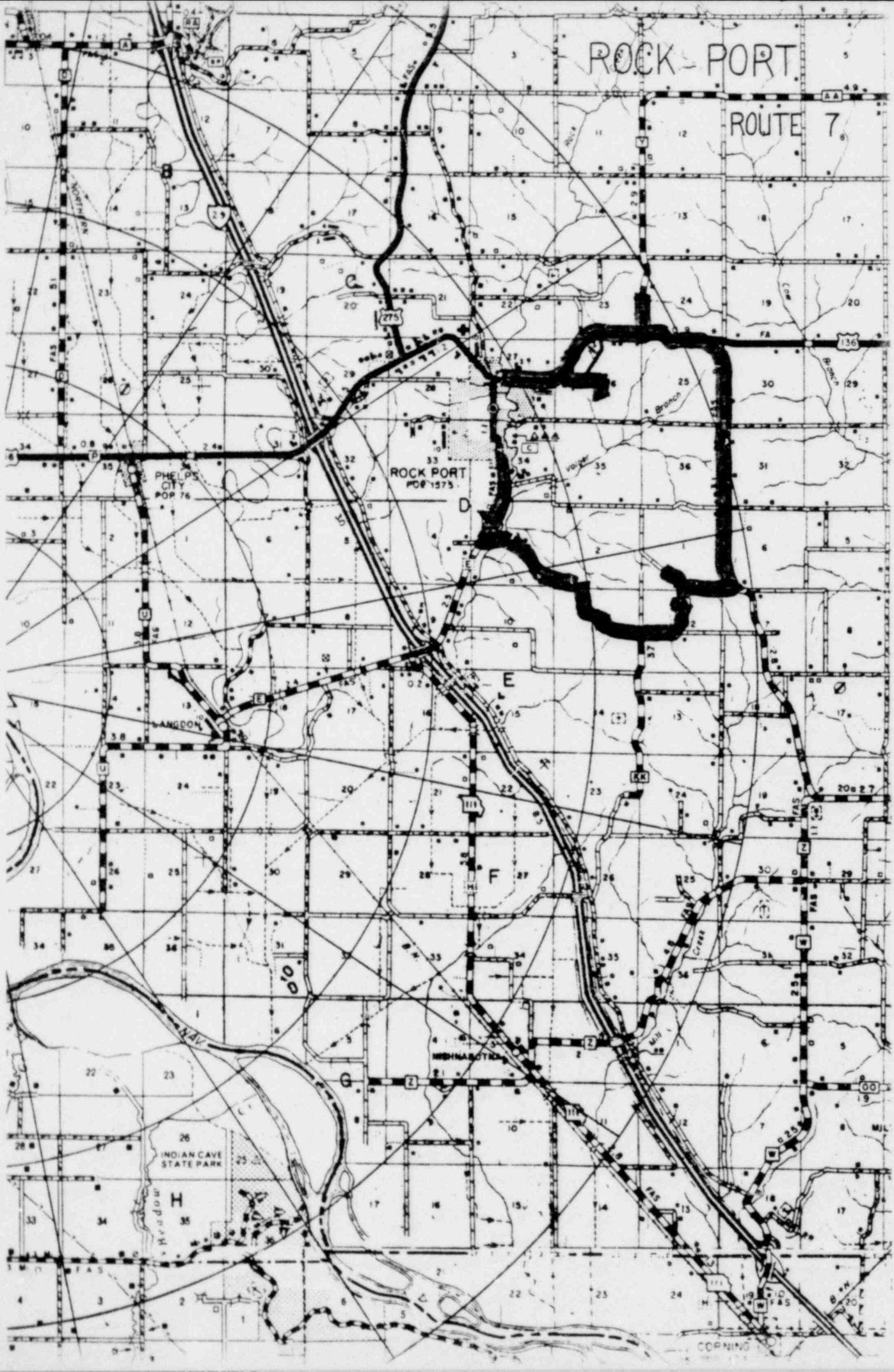

ROCK PORT
ROUTE 2
ROCK PORT
POP 1573
PHELPS CITY
POP 76
LANGDON
INDIAN CAVE STATE PARK
LINDEN
NORTHERN
Rock Creek
Branch
Creek
FAS
FA
A
B
C
D
E
F
G
H

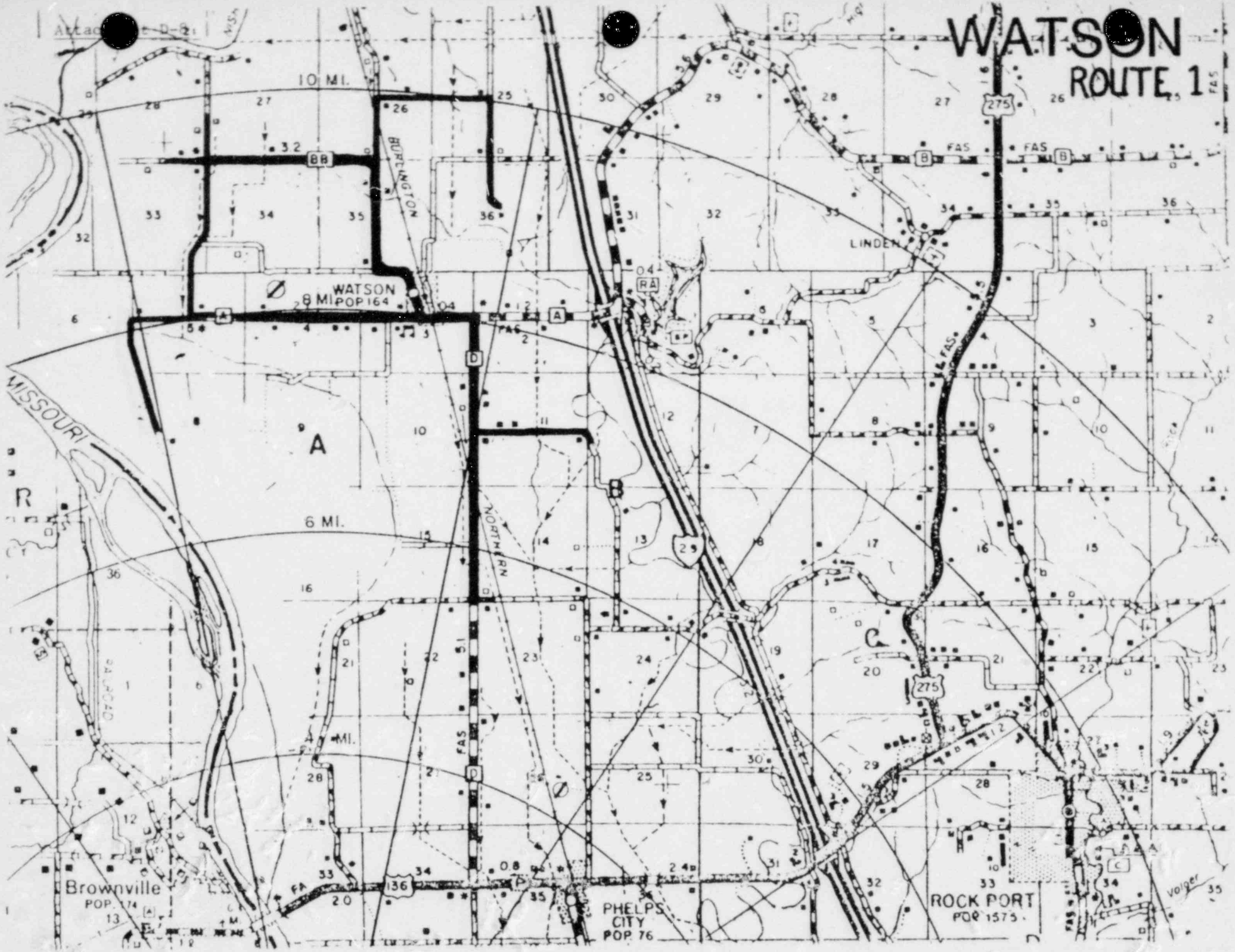

ROCK PORT
ROUTE 3
ROCK PORT
POP 1575
PHELPS
CITY
POP 76
LAGOON
INDIAN CAVE
STATE PARK
LINDEN
B
C
D
E
F
G
H


ROCK PORT
ROUTE 4
ROCK PORT
POP. 1575
PHELPS CITY
POP. 76
LANDON
INDIAN CAVE STATE PARK
NISHNABOTNA
NAV
Creek
Branch
FAS
136
275
29
36

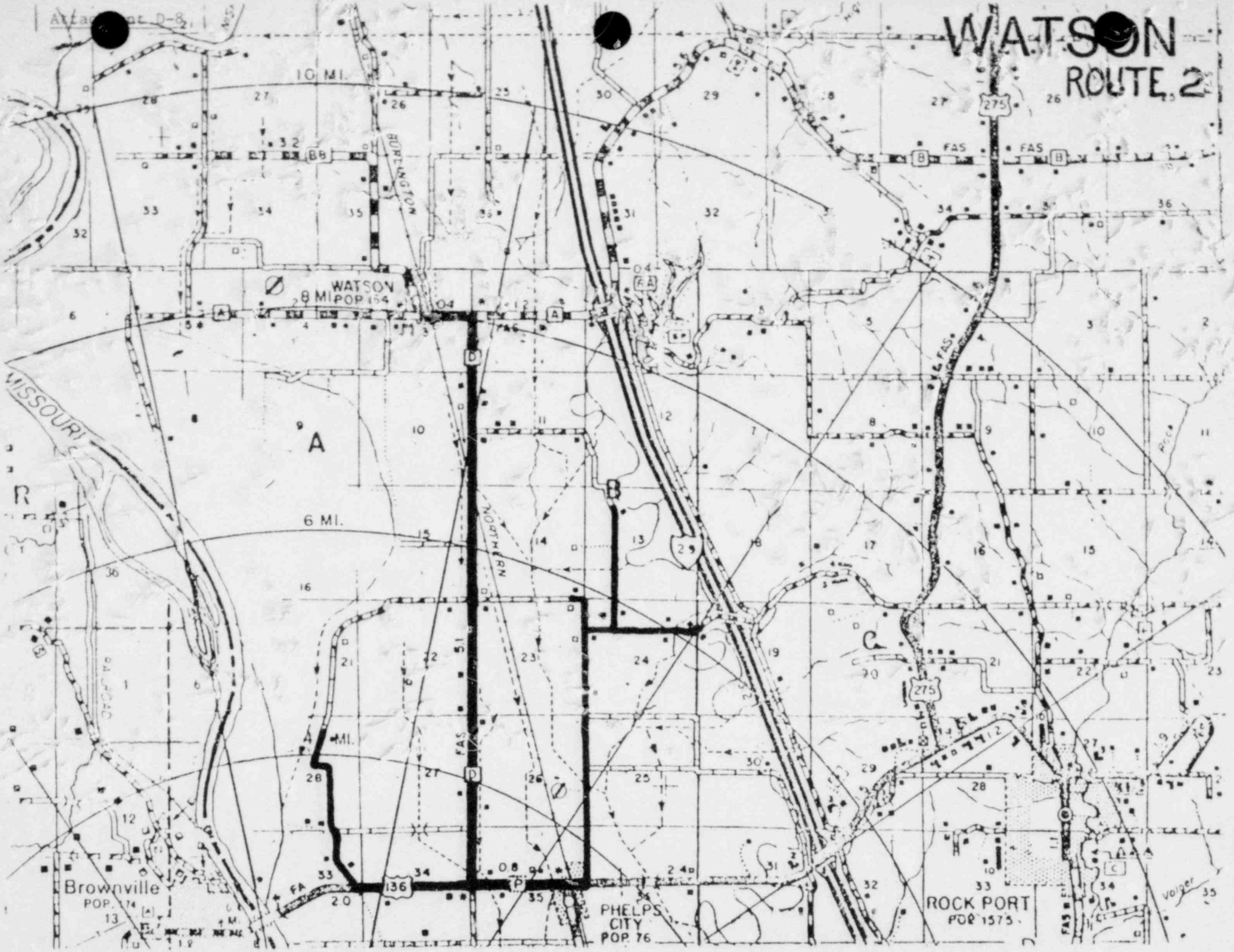

ROCK PORT
ROUTE 5
PHELPS CITY POP 76
ROCK PORT POP 1575
LANGDON
INDIAN CAVE STATE PARK
Hydaw
Branch
Creek
NISHNABOTNA
NORTHERN
LINDEN
A
B
C
D
E
F
G
H
S


ROCK PORT
ROUTE 6
ROCK PORT
POP 1375
PHELPS CITY
POP 76
LANGDON
INDIAN CAVE STATE PARK
NISHNABOTNA
Branch
Creek
A
B
C
D
E
F
G
H

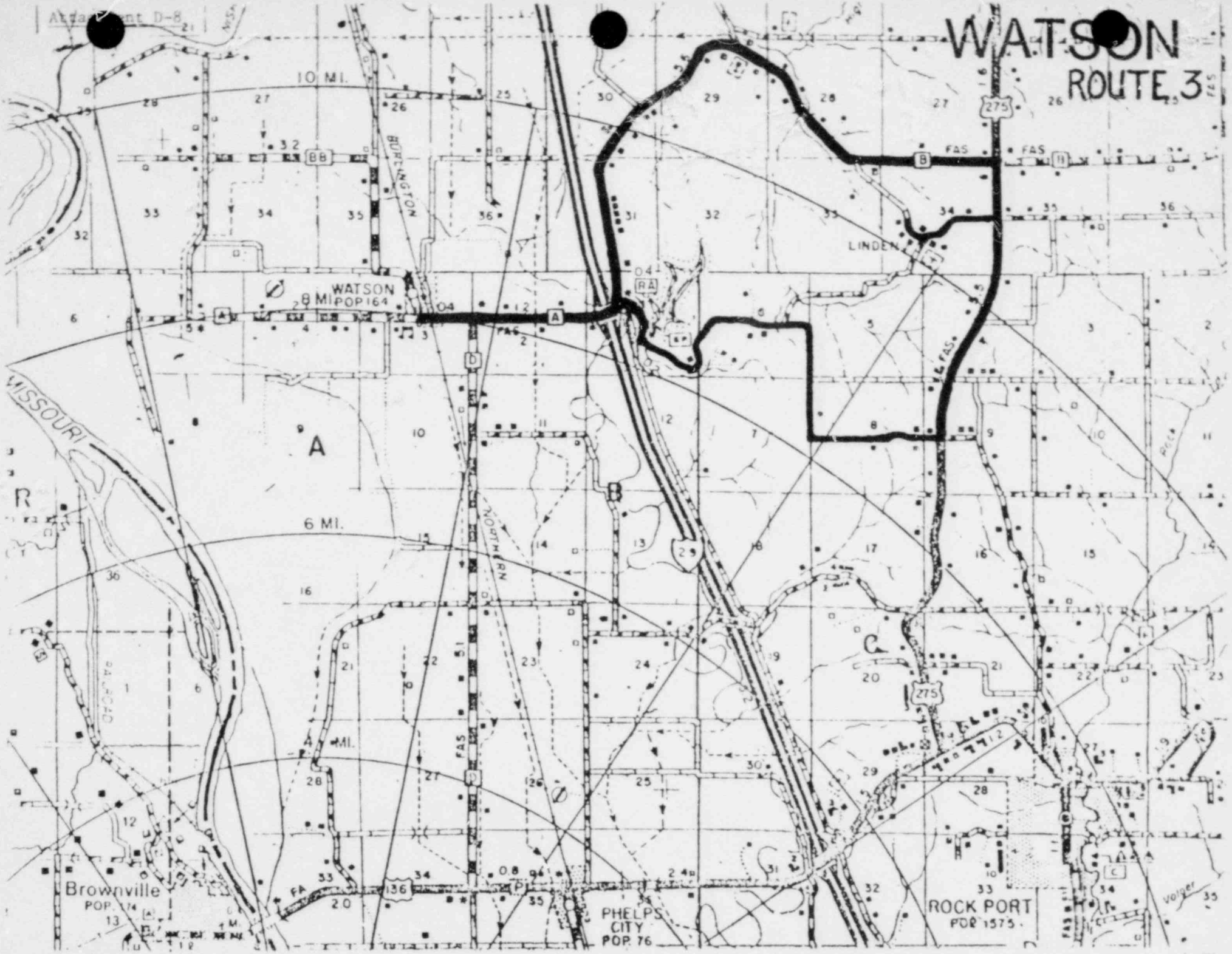

ROCK - PORT
ROUTE 7
ROCK PORT
POP 1575
PHELPS CITY
POP 76
INDIAN CAVE STATE PARK
HIGHWAY 275
HIGHWAY 136
CORNING


WATSON
ROUTE 1
10 MI.
6 MI.
4 MI.
WATSON
8 MI POP 164
LINDEN
MISSOURI
BURLINGTON
NORTHERN
Brownville
POP. 174
PHELPS
CITY
POP. 76
ROCK PORT
POP 1575
FAS
BB
A
B
C
D
R
136
275
29

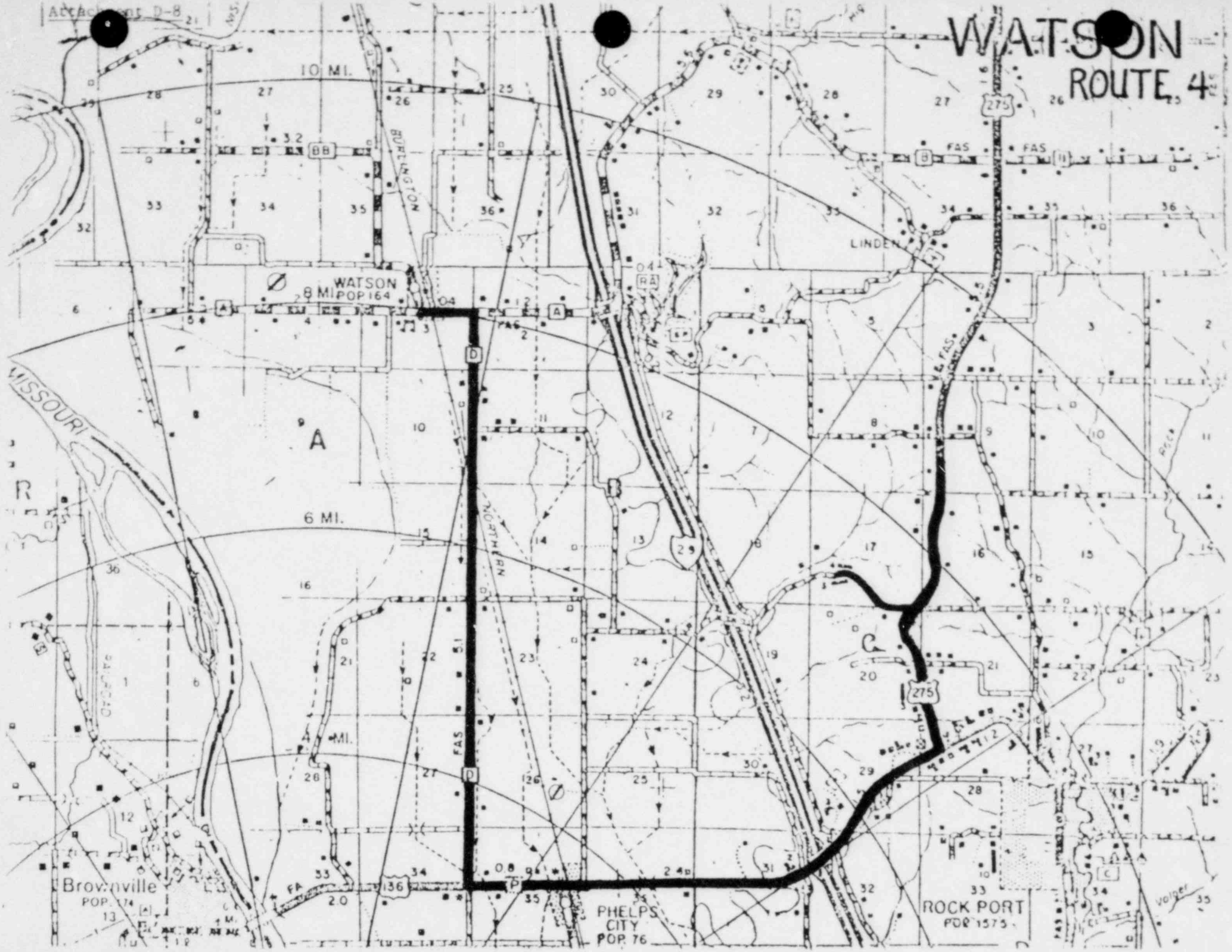
Attachment D-8



Attachment D-8



Attachment D-8



PERU VOLUNTEER FIRE DEPARTMENT - MOBILE SIREN PROCEDURE

This procedure outlines the steps to be taken in the event of an emergency at Cooper Nuclear Station. Please be aware that this system may also be used for floods, tornadoes, or other similar disasters.

1. The first volunteer to arrive at the Fire House will call the Nemaha County Sheriff in Auburn, NE at (402) 274-3139 or by using the base radio. This person will be informed by the Sheriff that there is an emergency in progress at Cooper Nuclear Station and that the Peru Volunteer Fire Department personnel will drive their notification routes.

2. The first volunteer in the Fire House may remain there to inform the other volunteers as they arrive of the reason for the siren activation and what their required actions area.

3. The volunteers will then mount the mobile sirens, if not already mounted, and prepare to drive their prescribed routes in accordance with the following:

   a. Before leaving the Fire House activate the mobile siren to verify its operability.

   b. Obtain designated route.

   c. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

   d. After completing the prescribed route, the driver will return to the Fire House, deenergize his siren, and inform the volunteer who stayed in the Fire House that he has completed the route.

4. When all routes are complete, call by telephone or radio the Nemaha County Sheriff confirming the completion of routes.

5. If any routes do not have drivers to cover them, the Fire House will make a call to the Nemaha County Sheriff (telephone number in Step 1.) requesting a driver under the mutual aid understanding.

Note: If any mobile siren unit should fail or need maintenance immediately contact Cooper Nuclear Station at (402) 825-3811 in order to effect repairs.

BROWNVILLE VOLUNTEER FIRE DEPARTMENT - MOBILE SIREN PROCEDURE

This procedure outlines the steps to be taken in the event of an emergency at Cooper Nuclear Station. Please be aware that this system may also be used for floods, tornadoes, or other similar disasters.

1. The first volunteer to arrive at the Fire House will call the Nemaha County Sheriff in Auburn, NE using the base radio. This person will be informed by the Sheriff that there is an emergency in progress at Cooper Nuclear Station and that the Brownville Volunteer Fire Department personnel will drive their notification routes.

2. The first volunteer in the Fire House may remain there to inform the other volunteers as they arrive of the reason for the siren activiation and what their required actions are.

3. The volunteers will then mount the mobile sirens, if not already mounted, the prepare to drive their prescribed routes in accordance with the following:

   a. Before leaving the Fire House activate the mobile siren to verify its operability.

   b. Obtain designated route.

   c. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

   d. After completing the prescribed route, the driver will return to the Fire House, deenergize his siren, and inform the volunteer who stayed in the Fire House that he has completed the route.

4. When all routes are complete, contact the Nemaha County Sheriff using the base radio, confirming the completion of routes.

5. If any routes do not have drivers to cover them, the Fire House will contact the Nemaha County Sheriff requesting a driver under the mutual aid understanding.

Note: If any mobile siren unit should fail or need maintenance immediately contact Cooper Nuclear Station at (402) 825-3811 in order to effect repairs.

NEMAHA VOLUNTEER FIRE DEPARTMENT - MOBILE SIREN PROCEDURE

This procedure outlines the steps to be taken in the event of an emergency at Cooper Nuclear Station. Please be aware that this system may also be used for floods, tornadoes, or other similar disasters.

1. The first volunteer to arrive at the Fire House will call the Nemaha County Sheriff in Auburn, NE at (402) 274-3139 or the Fire Chief's base radio. This person will be informed by the Sheriff that there is an emergency in progress at Cooper Nuclear Station and that the Nemaha Volunteer Fire Department personnel will drive their notification routes.

2. The first volunteer in the Fire House may remain there to inform the other volunteers as they arrive of the reason for the siren activation and what their required actions are.

3. The volunteers will then mount the mobile sirens, if not already mounted, and prepare to drive their prescribed routes in accordance with the following:

   a. Before leaving the Fire House activate the mobile siren to verify its operability.

   b. Obtain designated route.

   c. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

   d. After completing the prescribed route, the driver will return to the Fire House, deenergize his siren, and inform the volunteer who stayed in the Fire House that he has completed the route.

4. When all routes are complete, call by telephone (number in Step 1. above) or radio the Nemaha County Sheriff confirming the completion of routes.

5. If any routes do not have drivers to cover them, the Fire House will contact the Nemaha County Sheriff (telephone number in Step 1.) requesting a driver under the mutual aid understanding.

Note: If any mobile siren unit should fail or need maintenance immediately contact Cooper Nuclear Station at (402) 825-3811 in order to effect repairs.

SHUBERT VOLUNTEER FIRE DEPARTMENT - MOBILE SIREN PROCEDURE

This procedure outlines the steps to be taken in the vent of an emergency at Cooper Nuclear Station. Please be aware that this system may also be used for floods, tornadoes, or other similar disasters.

1. The first volunteer to arrive at the Fire House will call the Richardson County Sheriff in Falls City, NE at (402) 245-2479. This person will be informed by the Sheriff that there is an emergency in progress at Cooper Nuclear Station and that the Shubert Volunteer Fire Department personnel will drive their notification routes.

2. The first volunteer in the Fire House may remain there to inform the other volunteers as they arrive of the reason for the siren activation and what their required actions are.

3. The volunteers will then mount the mobile sirens and prepare to drive their prescribed routes in accordance with the following:

   a. Before leaving the Fire House activate the mobile siren to verify its operability.

   b. Obtain designated route.

   c. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

   d. After completing the prescribed route, the driver will return to the Fire House, deenergize his siren, and inform the volunteer who stayed in the Fire House that he has completed the route.

4. When all routes are complete, call the Richardson County Sheriff at the telephone number contained in Step 1. of this section, confirming the completion of routes.

5. If any routes do not have drivers to cover them, the Fire House will contact the Richardson County Sheriff (telephone number in Step 1.) requesting a driver under the mutual aid understanding.

Note: If any mobile siren unit should fail or need maintenance immediately contact Cooper Nuclear Station at (402) 825-3811 in order to effect repairs.

ROCK PORT VOLUNTEER FIRE DEPARTMENT - MOBILE SIREN PROCEDURE

This procedure outlines the steps to be taken in the event of an emergency at Cooper Nuclear Station. Please be aware that this system may also be used for floods, tornadoes, or other similar disasters.

1. The Rock Port Volunteer Firemen will be notified of an emergency by the Atchison County Sheriff who will contact them directly over their pagers by use of the tone encoder located in the Sheriff's office. The Sheriff's office telephone number is (816) 744-2887.

2. The volunteers should then proceed to the Fire House, mount the mobile units, if not already mounted, and prepare to drive their prescribed routes in accordance with the following:

   a. Before leaving the Fire House activate the mobile siren to verify its operability.

   b. Obtain designated route.

   c. The driver will drive at normal speeds and as he approaches a household or person he/she will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

   d. After completing the prescribed route the driver will return to the Fire House, deenergize his siren, and inform the volunteer who stayed in the Fire House that he has completed the route.

3. When all routes are complete, call the Atchison County Sheriff at the telephone number contained in Step 1. of this section, confirming the completion of routes.

4. If any routes do not have drivers to cover them, the Fire House will contact the Atchison County Sheriff (telephone number in Step 1.) requesting a driver under the mutual aid understanding.

Note: If any mobile siren unit should fail or need maintenance immediately contact Cooper Nuclear Station at (402) 825-3811 in order to effect repairs.

WATSON VOLUNTEER FIRE DEPARTMENT - MOBILE SIREN PROCEDURE

This procedure outlines the steps to be taken in the event of an emergency at Cooper Nuclear Station. Please be aware that this system may also be used for floods, torndadoes, or other similar disasters.

1. The first volunteer to arrive at the Fire House will contact the Atchison County Sheriff in Rock Port, MO by telephone, (816) 744-2887, or by using the base radio. This person will be informed by the Sheriff that there is an emergency in progress at Cooper Nuclear Station and that the Watson Volunteer Fire Department personnel will drive their notification routes.

2. The first volunteer in the Fire House may remain there to inform the other volunteers as they arrive of the reason for the siren activation and what their required actions are.

3. The volunteers will then mount the mobile sirens, if not already mounted, and prepare to drive their prescribed routes in accordance with the following:

   a. Before leaving the Fire House activate the mobile siren to verify its operability.

   b. Obtain designated route.

   c. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

   d. After completing the prescribed route, the driver will return to the Fire House, deenergize his siren, and inform the volunteer who stayed in the Fire House that he has completed the route.

4. When all routes are complete, call the Atchison County Sheriff at the telephone number contained in Step 1. of this section or base radio, confirming the completion of routes.

5. If any routes do not have drivers to cover them, the Fire House will contact the Atchison County Sheriff (telephone number in Step 1.) requesting a driver under the mutal aid understanding.

Note: If any mobile siren unit should fail or need maintenance immediately contact Cooper Nuclear Station at (402) 825-3811 in order to effect repairs.

NEMAHA COUNTY SHERIFF - MOBILE SIREN PROCEDURE

The siren routes are to be run in the event of activation of the prompt alerting system:

1. Dispatch two personnel in siren and public announcement equipped vehicles to cover the designated routes.

2. Before leaving, activate the mobile siren to verify its operability.

3. Obtain designated route.

4. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

5. When the route has been completed, contact the Sheriff and inform him of completion of the route.

RICHARDSON COUNTY SHERIFF - MOBILE SIREN PROCEDURE

The siren route is to be run in the event of activation of the prompt alerting system:

1. Dispatch personnel in siren and public announcement equipment vehicle to cover the designated routes in the Shubert area.

2. Before leaving, activate the mobile siren to verify its operability.

3. Obtain designated route.

4. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

5. When the route has been completed, contact the Sheriff and inform him of completion of the route.