

Figure 2 to Attachment 6 to Tab B to Appendix 5

2000 CENSUS POPULATION WITHIN 10-MILE EPZ OF NAPS

A. Permanent Residents

1. Louisa County	9,208
2. Spotsylvania	9,929
3. Orange	176
4. Hanover	716
5. Caroline	<u>263</u>
SUBTOTAL	20,292

B. Transient Population

Total	<u>380</u>
(see PAZ specific data for exact distribution)	

C. Institutionalized Population (Schools)

1. Livingston ES	399
2. Berkeley ES	661
3. Spotsylvania Co. HS	1,466
3. Thomas Jefferson ES	817
4. Louisa MS	1,160
5. Jouett ES	762
6. Louisa HS	<u>1,331</u>
SUBTOTAL	6,596

Figure 3 to Attachment 6 to Tab B to Appendix 5

2000 CENSUS POPULATION WITHIN 10-MILE EPZ OF NAPS

PUBLIC SCHOOLS within the NAPS 10-Mile EPZ

Bumpass			
	Jouett ES	5	762
Louisa			
	Thomas Jefferson ES	3	817
Mineral			
	Louisa County HS	3	1,331
	Louisa County MS	3	1,160
Spotsylvania			
	Berkely ES	21	399
	Livingston ES	12	536
	Spotsylvanis HS	21	1,466
	TOTAL		6,471

Source: Innovative Emergency Management, 2001

Figure 4 to Attachment 6 to Tab B to Appendix 5

2000 CENSUS POPULATION WITHIN 10-MILE EPZ OF NAPS

NAPS RESIDENT POPULATION DATA BY PAZ

2	424	-	424
3	1,257	-	1,257
4	837	-	837
5	1,331	-	1,331
6	308	-	308
7	318	-	318
8	289	-	289
9	117	-	117
10	300	-	300
11	740	-	740
12	951	30	981
13	991	-	991
14	541	228	769
15	451	122	573
16	1,589	-	1,589
17	176	-	176
18	1,664	-	1,664
19	246	-	246
20	894	-	894
21	2,172	-	2,172
22	1,355	-	1,355
23	263	-	263
24	716	-	716
25	253	-	253
26	1,729	-	1,729

Source: Innovative Emergency Management, 2001

Figure 5 to Attachment 6 to Tab B to Appendix 5

2000 CENSUS POPULATION WITHIN 10-MILE EPZ OF NAPS  
 NAPS 10-MILE EPZ POPULATION GROUPED BY COUNTY/CITY

Louisa	9,208	4,303	2.14	300	643
Spotsylvania	9,929	3,775	2.63	302	794
Orange	176	63	2.79	10	29
Hanover	716	269	2.66	19	50
Caroline	263	102	2.57	7	19
TOTAL	20,292	8,513	2.56	639	1,535

Source: Innovative Emergency Management, 2001

Figure 6 to Attachment 6 to Tab B to Appendix 5

2000 CENSUS POPULATION WITHIN 10-MILE EPZ OF NAPS

Network Clearance Times for NAPS EPZ

10 Mile Radius	18,782	1 hour 25 minutes	1 hour 30 minutes
5 Mile Radius	6,537	1 hours 35 minutes	1 hours 40 minutes
2 Mile Radius	1,837	1 hour 45 minutes	1 hour 45 minutes
Quadrant I	8,517	1 hours 30 minutes	1 hours 35 minutes
Quadrant II	8,177	1 hour 30 minutes	1 hour 30 minutes
Quadrant III	8,137	1 hours 30 minutes	1 hours 35 minutes
Quadrant IV	5,995	1 hour 35 minutes	1 hour 35 minutes

Source: Innovative Emergency Management, 2001

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Tab C to Appendix 4

HEALTH SERVICES

~~During radiological emergencies, health services will: (1) provide emergency medical care and treatment for victims of radiation exposure, and (2) take preventive and remedial measures to minimize the detrimental effects of radiation exposure, to include the special health problems that result. Reference Annex I J, Emergency Health Services, Volume II, Commonwealth of Virginia Emergency Operations Plan – Peacetime Disasters.~~

~~The local health department is the primary health response agency. It provides for:~~

- ~~(1) Health and sanitary facilities.~~
- ~~(2) Health and sanitation in evacuation assembly centers.~~
- ~~(3) Supervision of food and drug supplies, including detection and decontamination of radioactively contaminated food.~~
- ~~(4) Sanitary water supply.~~
- ~~(5) Decontamination of food preparation facilities.~~
- ~~(6) Transportation and medical care of victims of the radiological emergency, to include both those affected by radiation exposure or other type of injury or illness.~~

~~Local governments will respond to radiological emergencies using local resources. If requirements exceed local capabilities, the local health department will obtain assistance from adjacent localities through normal mutual support procedures or by requesting it from the Health Department. Orders will be placed with normal sources of supply. Orders that cannot be filled through normal distribution channels will be forwarded to the State Commissioner of Health. Essential health activities and facilities will be authorized to certify purchase orders. Military hospital assistance will be provided on a reimbursable basis only. Requests for this assistance will be forwarded to the Department of Emergency Management.~~

~~The Health Department provides assistance to local health departments, as required, with emphasis on the special requirements for those victims of radiation exposure or possible radiation exposure.~~

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Tab C to Appendix 5

SCHOOL RECEPTION CENTERS  
SURRY POWER STATION

ISLE OF WIGHT COUNTY

Handy Elementary School

Smithfield High School

JAMES CITY COUNTY

D. J. Montaque Elementary School  
Lafayette High School

Norge Elementary School  
Toano Middle School

CITY OF NEWPORT NEWS

B. T. Washington Middle School  
Briarfield Elementary School  
Carver Elementary School  
Crittenden Elementary School  
Deer Park Elementary School  
Dunbar Elementary School  
Heritage High School  
Hilton Elementary School  
Hines Middle School

Huntington Middle School  
Magruder Elementary School  
Newsome Park Elementary School  
New Horizons – Hampton  
Riverside Elementary School  
Sedgefield Elementary School  
South Morrison Elementary School  
Warwick High School  
Watkins Elementary School

SURRY COUNTY

L.P. Jackson Middle School  
Surry Elementary School

Surry High School

CITY OF WILLIAMSBURG

D. J. Montaque Elementary School  
Lafayette High School

Norge Elementary  
Toano Middle School

YORK COUNTY

Grafton High/Middle School Complex

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Tab D to Appendix 5

SCHOOL RECEPTION CENTERS  
NORTH ANNA POWER STATION

CAROLINE COUNTY

Ladysmith Elementary School  
Ladysmith Primary School

HANOVER COUNTY

Liberty Middle School  
Patrick Henry High School (For Louisa Co.)

LOUISA COUNTY

Gordon Barbour Elementary School (located in Orange Co.)  
Patrick Henry High School (located in Louisa Co.)

ORANGE COUNTY

Gordon Barbour Elementary School (for Louisa Co.)  
Orange Co. Middle School  
Prospect Heights Middle School

SPOTSYLVANIA COUNTY

Courtland High School  
Chancellor High School  
Massaponax High School



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Appendix 6:  
ACCIDENT ASSESSMENT

I. MISSION

The mission of State and local governments in accident assessment is to determine the projected and actual extent of the radiological emergency in order to decide what protective actions should be taken.

II. OPERATIONAL CONCEPTS AND PROCEDURES

A. Concept of Operations

The operator of the fixed nuclear facility will perform initial accident assessment as soon as possible after the release. Results of the assessment will be transmitted without delay to the Virginia EOC. The Radiological Health Programs, State Department of Health (RHP), will perform independent follow-on monitoring and assessment. RHP will continue to independently monitor and evaluate the off-site radiological situation to the extent possible until such activities are no longer required. Local governments will conduct radiological monitoring in accordance with their local Radiological Emergency Response Plans and report the results to the EOC.

B. Transportation Accidents Involving Radioactive Materials

(See Appendix 15 and Volume 4)

Initial accident assessment to evaluate radiation exposure cases and to protect emergency services personnel will be conducted by the emergency services organization at the scene. RHP will assume this responsibility when the radiological health personnel arrive at the scene and will continue assessment and evaluation until they are no longer required to respond.

C. Procedures

1. Fixed Nuclear Facilities

When a reportable incident on-site has occurred, the operator of the fixed nuclear facility will make an initial assessment to determine the magnitude of the problem and any projected dose off-site. The operator of the fixed nuclear facility will then notify State using the Report of Radiological Conditions at Tab C to Appendix 4. After initial notification and reports, the operator of the fixed nuclear facility will continue to report changes and refinements to

the Virginia EOC until off-site radiation levels are low enough that accident assessment is no longer required.

2. Local Government

Upon notification of a radiological emergency at a fixed nuclear facility, the affected local government will deploy radiological monitors in accordance with their local Radiological Emergency Response Plan to obtain exposure rate measurements. These measurements will be reported by the monitors to the local EOC so that they can be immediately forwarded to the Field Team Coordinator at the EOF. If the EOF is not yet operational, the field measurements should be reported to the RPH Radiological Operations Officer at the Virginia EOC until the EOF is operational.

3. State Government

RPH will independently perform follow-up monitoring and assessment activities of the radiological situation. Attachment 1 and Attachment 2 for environmental monitoring locations. Results of independently-collected data by RHP will be forwarded to the Field Team Coordinator at the EOF. If the EOF is not yet operational, the field measurements should be reported to the RHP Radiological Operations Officer at the Virginia EOC until the EOF is operational. State radiological assessment activities will be performed by a Radiological Emergency Response Team (RERT) composed of personnel from State agencies and supplemented by facility and Federal personnel, as appropriate. The State RERT will receive guidance and direction from the Field Team Coordinator at the EOF. After the monitoring and assessment function has been transferred from the EOF to the Virginia EOC, (likely not to occur until the emergency phase is over) radiological information will be forwarded to the State Radiological Operations Officer at the Virginia EOC. The RERT, including the mobile laboratory, can be operational on-site within three hours of notification and capable of 24-hour operation during the emergency. The mobile lab will be positioned at one of the Staging Areas located near each power station.

- a. A meteorologist from the Department of Environmental Quality will act as the State Meteorological Officer. He may operate from the meteorological center at the Dominion Innsbrook Technical Center, Glen Allen, VA and will be responsible for analyzing meteorological conditions in the affected areas and reporting them to the State Radiological Assessment Officer at the EOF. In addition to on-site meteorological information, the following off-site capability exists:

b. Detection and Assessment

BRH has the capability to detect iodine in the presence of noble gas at levels of  $10^{-7}$  uCi/cc through the use of air samplers with silver zeolite cartridges. These samplers are portable and run off either internal batteries or vehicle batteries. More complete identification of isotopic mixture of releases can be made by gamma spectroscopy in the BRH Mobile Laboratory. Additional capability will be provided through aerial monitoring by the Nuclear Emergency Search Team (NEST) and the U.S. Department of Energy (DOE) Flyover team. (These services would be utilized in accordance with the request for Federal assistance). Procedures for determining projected and actual dose rates and comparison with PAG's are contained in BRH SOP.

c. Emergency Environmental Sampling

State agencies will conduct emergency environmental sampling, this sampling will be conducted primarily in the ingestion exposure pathway 50-mile EPZ to detect any radiological contamination. The sampling is conducted to protect the public from consumption of contaminated food and water. See Attachment 3 -Location of Water Treatment Plants and Reservoirs. Reports will be made to the Field Team Coordinator at the EOF. A summary of sampling by State agencies follows:

(1) Department of Health

- (a) Environmental sampling will be performed in affected area(s) by BRH. Sampling will include sampling of ground and surface water, beta/gamma measurements using survey meters, and air, soil, and crop/vegetation samples.
- (b) Shellfish sampling will be performed by the Bureau of Shellfish Sanitation in coordination with RHP. Silt samples will be obtained along with shellfish samples.

(2) Department of Agriculture and Consumer Services

- (a) Milk sampling will be performed by the Department of Agriculture and Consumer Services in coordination with the State Department of Health. Ground water and forage (hay) samples will be collected at dairies at the same time milk samples are collected.

(3) Department of Environmental Quality

The Department of Environmental Quality will:

- (a) Collect water samples from rivers and lakes located within a radius of 50 miles of the nuclear power station.
- (b) Collect fish samples from waters adjacent to the nuclear power plant.
- (c) Assist the Department of Health in radiological monitoring and accident assessment

(4) Division of Consolidated Laboratory Department of General Services

The Division of Consolidated Labor will perform analysis of samples gathered as requested by the BRH. Results of analyses will be to the RHP Radiological Operations

### III. LOGISTICS

#### A. Equipment

##### 1. Local Government

Radiological monitoring equipment and dosimetry for local monitors will be supplied, maintained, and calibrated by the RHP. Some dosimetry equipment for emergency workers may be supplied by the Department of Health.

##### 2. State Government

Each State agency assigned a responsibility for radiological monitoring, sample collection, or analysis will supply and maintain its own equipment with support by VDEM. Additional requirements for emergency worker dosimetry will be provided by VDEM or by the Department of Health.

##### 3. Maps depicting State, local, and facility monitoring locations and routes are available at RHP offices to facilitate the rapid movement of the RERT to operational areas.

B. Training

1. State Government

Each State agency will train its own personnel to accomplish assigned missions with the assistance of radiological health specialists from RHP and VDEM.

2. Local Governments

Local governments will be responsible for maintaining a sufficient number of trained monitors to implement their Radiological Emergency Response Plans. Training assistance in the use of radiation detection equipment will be provided by VDEM in coordination with the Department of Health.

Attachments:

Tab A - Environmental Monitoring TLD Locations - Surry Power Station

Tab B - Environmental Monitoring TLD Locations - North Anna Power Station

Tab C - Water Treatment Plants Within 50 Miles of Nuclear Power Stations

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Tab A to Appendix 6

ENVIRONMENTAL MONITORING TLD LOCATIONS

SURRY POWER STATION

There are 16 environmental monitoring TLD's located within the 10-mile EPZ at Surry Power Station. The TLD's are part of the ongoing environmental monitoring program around the Surry Power Station. These TLD's are positioned at the following locations:

D-20	Surry Power Station
D-41	Surry County Social Services
D-42	Surry County Lawnes Creek
D-43	Surry County Route 628
D-44	Jamestown (near toll booth)
D-45	Newport News Lee Hall
D-73	Naval Weapons Station Enlisted Quarters
D-74	Naval Weapons Station Industrial Area
D-75	Naval Weapons Station Officer's Quarters
D-76	Newport News Fort Eustis
D-77	Williamsburg Busch Gardens
D-78	Williamsburg - Williamsburg Airport
D-79	Surry County Scotland Wharf
D-80	Surry County - Bacon's Castle
D-81	Surry County - Alliance
D-82	Surry County - Hog Point

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Tab B to Appendix 6

ENVIRONMENTAL MONITORING TLD LOCATIONS

NORTH ANNA POWER STATION

There are 12 environmental monitoring TLD's located within the 10-mile EPZ at North Anna Power Station. These TLD's are part of the ongoing environmental monitoring program around the North Anna Power Station. These TLD's are positioned at the following locations:

D-35	NAPS - Weathertower
D-50	Louisa County - Mineral
D-51	Louisa County - Wares Crossroads
D-52	Spotsylvania County - Good Hope Church
D-53	Spotsylvania County - Route 614
D-54	Louisa County - Frederick's Hall
D-84	Louisa County - Route 685
D-85	Spotsylvania County - Route 713
D-86	Louisa County - Bumpass Post Office
D-87	Spotsylvania County - Levy (Rt. 622)
D-88	Louisa County - Route 700
D-89	Louisa County - Aspen Hills Subdivision

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Tab C to Appendix 6

WATER TREATMENT PLANTS WITHIN 50 MILES OF NUCLEAR  
POWER STATIONS

SURRY POWER STATION

COUNTY

SOURCE

Chesterfield

Lake Chesdin

Gloucester

Beaverdam Reservoir

Greensville

Nottoway River

York

Jones Pond

CITY

Chesapeake

Northwest River

Hampton

Big Bethel Reservoir

Hopewell

Appomattox River

Newport News

Harwoods Mill Reservoir

Norfolk

Lake Prince

Portsmouth

Lake Cohoon

Richmond

James River



Tab C to Appendix 6 (continued)

NORTH ANNA POWER STATION

<u>COUNTY</u>	<u>SOURCE</u>
Suffolk	Lake F West Lake F East Lake I 10 other lakes
Williamsburg	Waller Mill Reservoir
Albemarle	Beaver Creek Reservoir  Totier Creek Reservoir  South Rivanna River  North Fork Rivanna  Ragged Mountain Reservoir & Sugar Hollow Reservoir
Caroline	Stevens Mill Run
Chesterfield	Swift Creek
Culpeper	Mountain Run
Fauquier	Cedar Run
Goochland	Beaverdam Creek James River
Hanover	North Anna River South Anna River
Madison	White Oak Run

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Tab C to Appendix 6 (continued)

NORTH ANNA POWER STATION

COUNTY

SOURCE

Orange

Rapidan River

Prince William

Lunga Reservoir  
Breckenridge Reservoir  
Gray Reservoir  
Cedar Run

Spotsylvania

Ni River

Stafford

Beaverdam Run  
Abel Lake  
Aquia Creek

CITY

Fredericksburg

Rappahannock River

Richmond

James River

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Appendix 7:  
RADIOLOGICAL EXPOSURE CONTROL

I. MISSION

To provide control of radiological exposure for State and local government radiological emergency response personnel, all other emergency response personnel, and the affected populace.

II. OPERATIONAL CONCEPT AND PROCEDURES

A. Concept of Operations

The hazards from radiation exposure during a nuclear incident may necessitate that citizens be protected to prevent or minimize their exposure. Protective Action Guides (PAGs) have been established by the Environmental Protection Agency (EPA) and accepted by the Commonwealth of Virginia. These PAGs under no circumstances imply an acceptable dose. A variety of protective actions are prescribed in this Plan at levels at or within the limits of the EPA PAGs. Tab A for the PAGs for the general public.

Responsibility for radiation exposure control rests primarily with local government. State agencies provide advice and guidance in technical areas, as requested. State agencies also conduct emergency functions in the affected areas, e.g., traffic control on State highways. Control of radiation exposure is accomplished by:

1. Manage egress from and control access to affected areas.
2. Continuous monitoring and limiting radiation exposures of emergency workers.
3. Monitoring evacuees and emergency workers for radiological contamination and providing decontamination, as needed.
4. Monitoring water and food supplies and restricting use, as necessary.
5. Monitor agricultural products and milk and restricting use, as necessary.
6. Administering, if necessary, stable iodine (potassium iodide) to emergency workers within the EPZ to prevent or reduce the accumulation of radioiodines in the thyroid gland.

## B. Overview

### 1. Traffic and Access Control

When evacuation is initiated, law enforcement officials will establish traffic control to assist evacuees in exiting the affected area. Citizens leaving the affected area will be encouraged to go to an Evacuation Assembly Center (EAC) for radiological monitoring.

When evacuation is completed and until such time as the area is determined to be safe, law enforcement officials will establish access control over the affected area. Only authorized personnel with adequate dosimetry will be permitted to enter the area. Generally, authorization will be limited to personnel with emergency functions or missions.

### 2. Emergency Worker Exposure Control

Emergency workers entering the affected area will be issued self-reading pocket dosimeters and thermoluminescent dosimeters. They will also fill out and carry with them Form REC-1, Emergency Worker Radiological Exposure Record.(See Tab C). Form REC-1, is maintained under the supervision of the local Radiation Officer (RO).

### 3. Monitoring and Decontamination of Evacuees and Emergency Workers

Normally, radiological monitoring of all evacuees will be conducted at EACs within 12 hours after notification of a release. The shelter areas at these facilities, once activated, will be staffed to operate 24 hours per day until the emergency is terminated. If an individual is found to be contaminated, the results of the monitoring will be entered on Form REC-2, Individual Radiation Exposure Record (See Tab D). If monitoring indicates an evacuee is radiologically-contaminated at a level in excess of 0.1 mR/hr above background, he/she will be decontaminated. Procedures for decontamination are outlined in local procedures.

### 4. Water Supplies

The State Department of Environmental Quality, in coordination with RHP, will supervise the taking of water samples from surface sources and open wells. The samples will be analyzed for the presence of radioactive materials by the Division of Consolidated Laboratory Services or the RHP Mobile Laboratory. If the analysis indicates that the water supplies are radiologically-contaminated, their use will be restricted. Monitoring of

restricted water supplies will continue until the water reaches an acceptable level of contamination as determined by the Department of Health (VDH).

5. Agricultural Products and Milk

The State Department of Agriculture and Consumer Services in coordination with BRH, will take samples of milk from dairy cattle and meat samples from packing firms and food samples from retail and wholesale establishments located within 50 miles of the nuclear power plant and provide them to the Division of Consolidated Laboratory Services for analysis (See Appendix 7 and Annex H).

The Department of Agriculture and Consumer Services will also coordinate the control and disposition of radiologically contaminated food, milk and animal feed. The Department will also impose restrictions as necessary on human and animal consumption of food and feed.

6. Potassium Iodide (KI) (Refer to Appendix 8, KI and Annex I)

III. LOGISTICS

A. Equipment

1. Radiation survey meters, portal monitors, self-reading pocket dosimeters and dosimeter chargers will be provided by RHP which will also calibrate the instruments and perform necessary maintenance at least annually. A supply of these instruments is prepositioned in each risk and host jurisdiction.
2. Non-self reading dosimeters, such as thermoluminescent dosimeters, will be supplied by RHP to each risk and host jurisdiction.
3. Other equipment relating to radiation will be supplied, if available, through RHP: alpha, beta, and gamma monitoring equipment; gamma spectrometers; air samplers, aerial monitoring equipment; decontamination gear; pocket dosimeters, and protective clothing.
4. See Tab E for a listing of equipment issued to local risk and host governments. State agencies and local governments will inventory and operationally inspect their equipment quarterly as well as prior to and after each use. Defective equipment will be returned to the RHP for exchange and repair.

5. Radiological equipment available at the State level for emergency personnel is listed in Tab F. This instrumentation and dosimeters plus that shown at Tab E is considered adequate in quantity and type to conduct appropriate monitoring and assessment tasks. The equipment is centrally-controlled to expedite site-specific allocation. Radiological equipment used by VDH and other state agencies is inspected and maintained by the RHP staff or other VDH unit responsible for that equipment.
6. Tab G provides instruction on dosimetry and exposure control. This attachment accompanies the Emergency Worker Radiological Exposure Record Form.

B. Training

1. Initial and annual training of radiological monitors in the use and maintenance of radiation detection equipment will be conducted by VDEM.

C. Local Governments

1. Designate and train a person as RO to issue dosimetry and maintain appropriate records on exposure of individuals in the jurisdiction's organization.
2. Assure that radiological monitors are properly trained in the use of their radiation detection equipment and associated procedures.
3. Inventory and inspect their assigned radiological monitoring equipment (See Tab E).

Attachments:

- Tab A - Protective Action Guidelines for the General Population
- Tab B - Emergency Worker Exposure Limits
- Tab C - Form (REC-1), Emergency Worker Radiation Exposure Record
- Tab D - Form (REC-2), Individual Radiation Exposure Record
- Tab E - Radiological Monitoring Equipment Issued to Local Governments
- Tab F - Radiological Monitoring Equipment Controlled by State Agencies
- Tab G - Worker Exposure Control - Use of Personal Dosimeters

Tab A to Appendix 7

PROTECTIVE ACTION GUIDES FOR THE GENERAL POPULATION  
 (EPA-400 as accepted by the Commonwealth of Virginia)

Protective Action	Normal Conditions	Competing Disasters
Evacuate General Population	1 Rem TEDE 5 Rem Thyroid CDE	5 Rem TEDE 25 Rem Thyroid CDE
Evacuate Special Populations	5 Rem TEDE 25 Rem Thyroid CDE	10 Rem TEDE 50 Rem Thyroid CDE

Additional Considerations

1. No specific minimum level is established for initiation of sheltering.
2. Sheltering should always be implemented in cases when evacuation is not carried out at projected doses of 1 Rem or more.
3. Because of the higher risk associated with evacuation of some special groups in the population (e.g. those who are not readily mobile), sheltering may be the preferred alternative for such groups as a protective action at projected doses up to 5 Rem under normal conditions.
4. In general, sheltering should be preferred to evacuation whenever it provides equal or greater protection.

The following should also be considered for Protective Action Decisions made after the initial one:

- a) Plant conditions and emergency classification level.
- b) Projected and/or actual doses.
- c) Meteorological conditions.
- d) Shelter availability.
- e) Evacuation time estimates.
- f) Evacuation risks.

Definitions

- CDE (Committed Dose Equivalent) - dose to the thyroid from radiation  
 CEDE (Committed Effective Dose Equivalent) - dose incurred from inhalation of radioactive materials from exposure and intake during the early phase.  
 DDE (Deep Dose Equivalent) - Deep Dose Equivalent and Effective Dose Equivalent are the same if the body exposure is uniform (a typical situation).  
 EDE (Effective Dose Equivalent) - Dose from external radiation.  
 TEDE (Total Effective Dose Equivalent) = Deep Dose Equivalent (DDE) + Committed Effective Dose Equivalent (CEDE).

Tab B 2 to Appendix 7

EPA PROTECTIVE ACTION GUIDELINES  
 EMERGENCY WORKER EXPOSURE LIMITS

<u>Rem*</u>	<u>ACTIVITY</u>
5	all
5	protecting valuable property
12.5	lifesaving or protection of large populations
>12.5	voluntary lifesaving or protection of large populations

\* TEDE to nonpregnant adults from exposure during an emergency situation

COMMONWEALTH OF VIRGINIA  
 EMERGENCY WORKER EXPOSURE LIMITS\*\*

Activity	Dose Limit (in Rem)		
	SRD Reading (initial ratio)	TEDE***	CDE (thyroid)
Reporting	1.5 R	3 Rem	
Turnback	2.5 R	5 Rem	
Lifesaving	12.5 R	25 Rem	
Voluntary Lifesaving	>12.5 R	>25 Rem	>250 Rem
Administration of KI			25 Rem

\*\* Minors and the unborn are limited to one tenth of these values.

\*\*\* TEDE is estimated using dosimetry readings multiplied by a TEDE/DDE conversion factor.

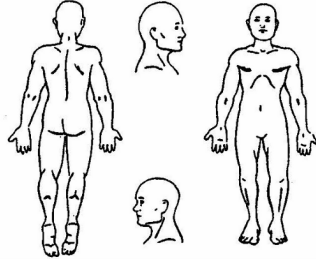
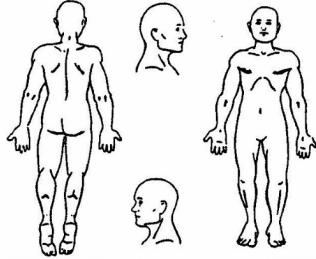
The TEDE/DDE conversion factor is derived from accident type and in-plant sample analysis.



Tab C to Appendix 7

Form REC-1 EMERGENCY WORKER RADIATION EXPOSURE RECORD			
NAME		AGE	I.D. # (assign 4 digit number)
ADDRESS			
CITY		STATE	ZIP CODE
TELEPHONE (home) ( ) -		TELEPHONE (business) ( ) -	
POSITION			
EMERGENCY DUTIES			
DOSIMETRY SERIAL NUMBERS			
TLD		_____	
0-20 R SELF READING DOSIMETER		_____	
OTHER _____		_____	
DOSIMETER READINGS (Note: Dosimeters should be read every 30 minutes)			
START DATE		END DATE	
TIME	0-20 R SRD READING	TIME	0-20 R SRD READING
TLD EXPOSURE (To be determined by laboratory analysis later)			
POTASSIUM IODIDE (KI) TAKEN?		REPEATED EVERY 24 HOURS?	
DATE	TIME	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Tab D to Appendix 7

<b>Form REC-2</b> <b>INDIVIDUAL RADIATION EXPOSURE RECORD</b>			
<b>I. REGISTRATION: TO BE COMPLETED BY FACILITY PERSONNEL</b>			
DATE	TIME	FACILITY (EAC)	
NAME (Last, First, MI)		AGE	SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE
TELEPHONE (home) ( ) - ( ) - ( )	TELEPHONE (business) ( ) - ( ) - ( )	SS# - - -	
HOME ADDRESS		CITY	STATE      ZIP CODE
<b>II. BRIEFLY DESCRIBE THE PERSON'S WHEREABOUTS AND ACTIVITIES</b>			
<b>III. PERSONNEL CONTAMINATION</b>			
Indicate Areas and Levels of Contamination Before Decontamination		Indicate Areas and Levels of Contamination After Decontamination	
			
<b>IV. BRIEFLY DESCRIBE CONTAMINATION</b>			
<b>V. INDICATE DECONTAMINATION METHOD(S) USED</b>			
<input type="checkbox"/> REMOVAL OF CLOTHING <input type="checkbox"/> WASHING OF ISOLATED AREAS (with warm water and soap) <input type="checkbox"/> SHOWER (with warm water and soap)		<input type="checkbox"/> OTHER - briefly describe: _____ _____ _____	
<b>VI. CONCLUSION</b>			
<input type="checkbox"/> INDIVIDUAL DECONTAMINATED <input type="checkbox"/> CONTINUED CONTAMINATION GREATER THAN TWICE BACKGROUND		<input type="checkbox"/> INDIVIDUAL SENT TO _____ HOSPITAL DUE TO <input type="checkbox"/> INJURY <input type="checkbox"/> CONTAMINATION	

Tab E to Appendix 7

RADIOLOGICAL MONITORING EQUIPMENT  
 ISSUED TO LOCAL GOVERNMENTS

Jurisdiction	TLDs	0-20R Dosimeter Model 622	Ludlum 2240 Meter	Ludlum Model 52 Portal Monitor
North Anna Power Station Risk Jurisdictions				
Spotsylvania Co.	200	49	10	2
Louisa Co.	200	50	8	1
Orange Co.	60	28	7	1
Hanover Co.	60	26	16	1
Caroline Co.	50	32	6	1
Surry Power Station Risk Jurisdictions				
Surry Co.	120	61	6	0
Isle of Wight Co.	70	31	4	1
James City Co.	250	68	14	0
Williamsburg	100	67	6	0
York Co.	170	51	17	1
Newport News	450	87	12	4
Surry Power Station Host Jurisdictions				
New Kent Co.	80	38	7	1
Charles City Co.	50	20	9	1
Hampton	80	20	6	2
Poquoson	0	0	0	0

---

Tab F to Appendix 7

RADIOLOGICAL MONITORING EQUIPMENT  
CONTROLLED BY STATE AGENCIES\*

<u>Agency</u>	<u>TLDs</u>
Department of Emergency Management	340
Department of Health - BRH**	100
Department of Agriculture and Consumer Services	10
Department of Transportation	30
Department of Game and Inland Fisheries	20
Department of State Police	400
Eastern State	10
College of William and Mary	10
TOTAL	900

\* A supply of TLDs will be made available to any other state agencies conducting environmental sampling in the ingestion pathway.

Tab G to Appendix 7

WORKER EXPOSURE CONTROL - USE OF PERSONAL DOSIMETRY

You should have the following items:

1. 0-20 R dosimeter
  2. TLD (a non-self reading dosimeter)
  3. Potassium Iodide (KI)
  4. Patient Package Insert for KI
  5. REC-1, Emergency Worker Radiological Exposure Record
  6. Emergency Worker Informational Card
- Make sure you recorded, on Form REC-1, the initial reading of your dosimeter.
  - You must read the dosimeter every 30 minutes and record the reading on Form REC-1.

Unless otherwise instructed\*, the following levels (as read on a dosimeter) and actions should be followed:

<u>Reporting Level</u>	3 R
	Report reading to the EOC
	Ask if you should exceed 5 R
	Request that a replacement be located, if possible
<u>Turnback Level</u>	5 R
	Leave the area unless turnback level is raised
	Notify EOC that you have left your assignment
	Proceed to the nearest Evacuation Assembly Center
<u>Voluntary Lifesaving</u>	>8 R
	Exceeding 8 R is voluntary

*Depending on the accident type, these levels may be adjusted in order to limit your total dose to EPA's guidance for emergency workers. \*\* Minors and declared pregnant females are limited to one tenth of these levels.*

POTASSIUM IODIDE (KI)

- Only take a KI tablet if you are instructed to do so by your Radiological Officer. He is given these instructions by a Health Department medical doctor, who has analyzed the contents of the release from the nuclear power station.
- Only take 1 tablet every 24 hours for 10 days unless otherwise instructed.
- More than one tablet a day will not give you additional benefit and could actually harm you. If you think you are allergic to iodide (e.g., seafood), do not take the KI.
- If you are instructed to take KI and do so, record this on the bottom of your REC-1 Form. Emergency Worker Radiological Exposure Record.

At the end of your assignment go to the EAC and turn in your dosimetry, REC-1 and your KI, if you were not instructed to take it.

Appendix 8:  
Potassium Iodide (KI) Administration

I. MISSION

The purpose of this plan is to provide guidance for the effective administration of potassium iodide (KI) as a supplement to other primary protective measures—evacuation and sheltering—in the event of a radiological emergency involving the North Anna Power Station (NAPS) or the Surry Power Station (SPS).

II. RESPONSIBLE ORGANIZATIONS AND AGENCIES

A. VIRGINIA DEPARTMENT OF HEALTH (VDH)

1. Local Health Districts (LHDs)
2. Radiological Health Program (RHP)
3. Emergency Preparedness and Response Program (EP&R)

B. VIRGINIA DEPARTMENT OF EMERGENCY MANAGEMENT (VDEM)

C. LOCAL GOVERNMENTS WITHIN 10 MILES OF THE NORTH ANNA POWER STATION

1. Caroline County
2. Hanover County
3. Louisa County
4. Orange County
5. Spotsylvania County

D. LOCAL GOVERNMENTS WITHIN 10 MILES OF THE SURRY POWER STATION AND HOST AREA JURISDICTIONS

1. Isle of Wight County
2. James City County

3. Surry County
4. York County
5. City of Newport News
6. City of Williamsburg
7. Charles City County – Host (not within ten miles of SPS)
8. New Kent County – Host (not within ten miles of SPS)
9. City of Hampton – Host (not within ten miles of SPS)
10. City of Poquoson – Host (not within ten miles of SPS)

E. DOMINION

III. CONCEPT OF OPERATIONS

A. OVERVIEW

1. Non-emergency Activities

KI will be made available to the populations within the 10-mile Emergency Planning Zone (EPZ) of both NAPS and SPS through a publicized voluntary dispensary program. Additionally, public information concerning the ingestion of potassium iodide will be made available annually in several formats. Plans and Standard Operating Procedures (SOPs) will be developed to govern the pre-distribution of KI before an emergency, as well as its distribution in the event of an actual emergency. The implementation of this plan will be incorporated in to existing training programs.

2. Emergency Activities

Radiation levels will be monitored and assessed against KI administration thresholds. If those levels appear imminent or are exceeded, protective action decisions regarding KI will be transmitted to local government Emergency Operation Centers (EOC) and broadcast to the general public using the Emergency Alert System (EAS), as provided for in the Commonwealth of Virginia Radiological Emergency Response Plan

(COVRERP). KI will be made available at Evacuation Assembly Centers (EAC) for distribution to the general public.

B. VIRGINIA DEPARTMENT OF EMERGENCY MANAGEMENT (VDEM)

1. Non-Emergency Phase

- a. Coordinate with VDH to develop plans and procedures to govern the use of KI.
- b. Incorporate into existing training programs the implications of a decision to administer KI to the general public.
- c. Conduct biennial exercises at NAPS and SPS as required to demonstrate the effective administration and distribution of potassium iodide.
- d. In consultation and cooperation with VDH, issue news releases that pertain to distribution sites and produce updated printed emergency public information on KI for the general public. These materials include the Emergency Planning Information Calendars for the North Anna Power Station and the Surry Power Station, online resources, transient brochures and telephone directory inserts throughout the North Anna and Surry 10-mile Emergency Planning Zones.
- e. Provide necessary information to VDH on quantities of KI needed to be maintained available for distribution to the population at large, emergency workers and EACs.

2. Emergency Phase

- a. Coordinate communications between the nuclear station's Local Emergency Operations Facility (LEOF) or its backup, the Central Emergency Operations Facility (CEOF) if used, the Virginia Emergency Operations Center (VEOC), the VDH Emergency Coordination Center (ECC) and local EOCs on recommendations and decisions to issue KI for both emergency workers and the general public.
- b. The VEOC will transmit to each local EOC the protective action decision on the use of KI for both emergency workers and the



general public.

- c. The Public Information Officer (PIO) will issue news releases regarding the use of KI.
- d. The notification of the recommendation to take KI will be disseminated through the Emergency Alert System (EAS) originating at the VEOC.

C. VIRGINIA DEPARTMENT OF HEALTH (VDH)

1. Non-Emergency Phase

- a. Develop plans and procedures for Local Health Districts to govern the distribution and administration of KI before and during an emergency.
- b. Develop training programs for medical support personnel who may be called upon to care for off-site victims of a radiological accident and assist in conducting other radiological training programs.
- c. Develop a distribution program for persons who live or work within 10 miles of North Anna Power Station or Surry Power Station in which the general public may voluntarily request and pick up potassium iodide pills from the local health district or other location(s).
- d. Coordinate with local emergency management on the storage and maintenance of sufficient KI stockpiles for subsequent replenishment, at either local emergency management or local health departments, as determined by the jurisdiction, and placement at other distribution locations such as Evacuation Assembly Centers (EAC).
- e. Maintain record of all persons receiving KI distributed through this program. All sites or facilities where KI is dispensed will use a KI receipt form. See Tabs B and C.
- f. Retain KI supplies remaining on hand after shipment to local health districts as designated by the State Health Commissioner.



D. LOCAL HEALTH DEPARTMENT

1. Non-emergency Phase

- a. KI supplies will be made available in strategic locations such as EACs, LHDs and/or local Emergency Management offices for dissemination. The specific KI locations will be jointly determined by the risk or host area jurisdiction and the LHD.
- b. Participate and assist in training offered by the Virginia Department of Emergency Management and the Virginia Department of Health.
- c. Provide local emergency management the quantities of KI needed for use by Emergency Workers.
- d. Coordinate with local emergency management and other appropriate offices (e.g. social services) to pre-distribute KI to special needs and institutionalized populations.
- e. Pre-stage or have available adequate quantities of KI for each EAC. Ensure adequate supplies of KI are available for staging at each EAC (to accommodate numbers of evacuees estimated by VDEM).

2. Emergency Phase

- a. Local EOCs will receive the KI Decision via communication from the VEOC and will inform the Health Department District Representative.
- b. Distribute KI in EACs during an emergency (when required).
- c. In accordance with local Radiological Emergency Response Plans, work with local Radiological Officer on KI utilization by emergency workers when performing functions within the 10-mile Emergency Planning Zone to prevent damage to the thyroid.
- d. Provide health care personnel at each EAC to contend with possible adverse reactions to KI.

E. OPERATOR OF FIXED NUCLEAR FACILITY – Dominion

1. On-site protective actions within the NAPS or SPS site boundary, and for utility monitoring teams dispatched beyond the site boundary, are the responsibility of Dominion.
2. Dominion, based on nuclear station monitoring equipment and instrumentation, will make an initial assessment of the emergency that will include a projection of off-site consequences. RHP officials located in the LEOF (or CEOF, if used) will review this initial on-site assessment as soon as possible. Ongoing assessments will be made by RHP in cooperation with the Dominion Health Physics, based on on-site instrumentation, meteorological conditions and off-site radiation monitoring reports provided by the utility, local and state field monitoring teams.
3. Dominion will issue a Protective Action Recommendation (PAR) on the use of KI for the public to the VEOC. This recommendation will be included in Item 10 of the Report of Emergency form.

Attachments:

- Tab A - Recommended Doses of KI and trigger points
- Tab B - Potassium Iodide (KI) Receipt Form (non-emergency)
- Tab C - Potassium Iodide (KI) Receipt Form (emergency)
- Tab D - Recipient Information Sheet
- Tab E - Report of KI Decision and Administration
- Tab F - EAC's – SPS/NAPS

1. GENERAL PUBLIC – EMERGENCY PHASE

<b>Table 1 Recommended Doses of KI for Different Risk Groups</b>				
	Predicted Thyroid exposure (cGy or REM)	KI dose (mg)	# of 130 mg tablets	# of 65 mg tablets
Adults over 40 yrs	≥500	130	1	2
Adults over 18 through 40 yrs	≥5 <sup>#</sup>	130	1	2
Pregnant or lactating women	≥ 5	130	1	2
Adoles. Over 12 through 18 yrs*		65	1/2	1
Children over 3 through 12 yrs		65	1/2	1
Over 1 month through 3 years**		32	1/4	1/2
Birth through 1 month		16	1/8	1/4

\* Adolescents approaching adult size (≥ 70 kg or 150 lbs) should receive full adult dose (130 mg).

\*\* The portion of the tablet used may be dissolved in a small amount of juice or water to facilitate ingestion by the child/infant.

# While FDA guidance suggests a threshold of 10 Rem, the Commonwealth has established a conservative limit of 5 Rem Thyroid exposure for KI distribution to the general population.

2. EMERGENCY WORKERS

This plan changes the threshold for recommending KI to be taken by emergency workers. The previous level of 25 rem to the thyroid has been lowered to 5 rem thyroid.

<b>Table 2. EMERGENCY WORKER EXPOSURE LIMITS*</b>			
Activity	Dose Limit (rem)		
	SRD Reading	TEDE (SRD x ratio)	CDE (thyroid)
Reporting	3	9	
Turnback	5	15	
Voluntary Lifesaving	>8	>25	>250
Administration of KI			≥5*

\*Changed September 9, 2002

Tab B to Appendix 8  
**POTASSIUM IODIDE (KI) RECEIPT FORM**  
**(NON-EMERGENCY USE)**

**DISTRIBUTION POINT** \_\_\_\_\_  
Name of Facility

**LOCAL GOVERNMENT** \_\_\_\_\_  
Name of Jurisdiction

**Virginia Department of Health**  
**POTASSIUM IODIDE (KI) RECEIPT FORM**  
**(For persons living or working within 10 miles of North Anna Power Station or Surry Power Station)**

1. I acknowledge that I live within, or am presently employed at a facility within, the 10-mile Emergency Planning Zone (EPZ) of the North Anna Power Station or Surry Power Station.
2. I understand that a single KI pill is available for each person within the household in which I reside and recognize that this KI pill has been supplied by the Virginia Department of Health solely for these individuals.
3. I have read the recipient information sheet provided by the Virginia Department of Health.
4. I understand that no one who is allergic to seafood or other substance containing iodine should take this tablet.
5. I understand that if this pill(s) is misplaced or destroyed, I may purchase a replacement at my expense. The Virginia Department of Health will not replace pills that are misplaced, lost, stolen or destroyed.
6. I understand this tablet is most effective when taken within four hours of exposure to radioactive iodine and that only one pill should be taken within a 24-hour period. If taken after four hours following exposure, its effectiveness is substantially reduced.

**NAME (Print)** \_\_\_\_\_

**SIGNATURE** \_\_\_\_\_

**ADDRESS** \_\_\_\_\_

\_\_\_\_\_ **Zip Code** \_\_\_\_\_

**DATE** \_\_\_\_\_

**NUMBER OF INDIVIDUALS RESIDING AT THIS ADDRESS  
FOR WHOM A TABLET IS REQUESTED** \_\_\_\_\_

**North Anna Power Station Protective Action Zone (PAZ) Number** \_\_\_\_\_

**Surry Power Station Protective Action Zone (PAZ) Number** \_\_\_\_\_

Tab C to Appendix 8  
**POTASSIUM IODIDE (KI) RECEIPT FORM**  
**(EMERGENCY USE)**

**DISTRIBUTION POINT** \_\_\_\_\_  
Name of Facility

**LOCAL GOVERNMENT** \_\_\_\_\_  
Name of Jurisdiction

**Virginia Department of Health**  
**POTASSIUM IODIDE (KI) RECEIPT FORM**  
**(For persons receiving KI in an emergency situation)**

1. I have read the recipient information sheet provided by the Virginia Department of Health.
2. I understand that no one who is allergic to seafood or other substance containing iodine should take this tablet and, to the best of my knowledge, I am not allergic to seafood.
3. I understand this tablet is most effective when taken within four hours of exposure to radioactive iodine and that only one pill should be taken within a 24-hour period. If taken after four hours following exposure, its effectiveness is substantially reduced.

**NAME (Print)** \_\_\_\_\_

**SIGNATURE** \_\_\_\_\_

**ADDRESS** \_\_\_\_\_

\_\_\_\_\_ **Zip Code** \_\_\_\_\_

**DATE** \_\_\_\_\_

**NUMBER OF INDIVIDUALS RESIDING  
FOR WHOM A TABLET IS REQUESTED** \_\_\_\_\_

**North Anna Power Station Protective Action Zone (PAZ) Number** \_\_\_\_\_

**Surry Power Station Protective Action Zone (PAZ) Number** \_\_\_\_\_

Tab D to Appendix 8



Virginia Department of Health  
Division of Health Hazards Control

P.O. Box 2448, 1500 East Main Street, Room 124  
Richmond, Virginia 23218  
Telephone (804)786-1763 FAX (804)786-9510



**Recipient Information Sheet  
Potassium Iodide (KI)**

**What is potassium iodide?**

Potassium iodide, or KI, is a salt, which is routinely added to table salt to make it "iodized." Potassium iodide is found in some foods, especially in seafood. It can be used as a supplement to evacuation and sheltering in the event of radioactive iodine release in a nuclear power plant accident.

**What is the role of potassium iodide in a nuclear power plant accident?**

Potassium iodide is a medication that, if taken in an appropriate dosage and in a timely manner, can block uptake of radioactive iodine by the thyroid gland and reduce the risk of thyroid cancer. Radioactive iodine is one of the major contaminants that could be released in a nuclear power plant accident. Exposure to radioactive iodine through ingestion or inhalation can increase the risk of developing thyroid cancer in humans. Children are more likely to develop thyroid cancer following exposure to radioactive iodine.

**What is the thyroid?**

The thyroid is a gland located in the neck, below the Adam's apple. It makes and stores hormones that help regulate heart rate, blood pressure, body temperature, and metabolism (the rate at which food is converted to energy). Thyroid hormones also help children grow and develop. The thyroid uses iodine to make its hormones.

**How does potassium iodide protect against thyroid cancer?**

The thyroid gland requires certain levels and forms of iodine to function properly. Too much or too little iodine in the thyroid gland can result in thyroid diseases. Most people get the iodine they need from foods, such as fish or iodized salt. The thyroid gland can store or hold certain amounts of iodine. When taken in proper doses, potassium iodide floods the thyroid gland with non-radioactive iodine so that inhaled or ingested radioactive iodine is not able to accumulate in the thyroid. Therefore, the risk of short term and long term harmful effects on the thyroid gland is reduced.

**Does potassium iodide protect from all radiation releases in a nuclear power plant accident?**

No. Potassium iodide protects only the thyroid gland and prevents absorption of radioactive iodine. It does not provide protection against other radioactive chemicals that may be emitted during a nuclear power plant accident. Potassium iodide also is not effective against direct gamma radiation that could result during a nuclear power plant accident.

**What is the most effective protection against radiation?**

The most effective protective measure against exposure to radiation and radioactive chemicals released during a nuclear power plant accident is sheltering or evacuation. **Taking potassium iodide is not a substitute for sheltering or evacuation.** Evacuation protects the whole body, including the thyroid gland, from all types of radiation and all possible exposure pathways.

**When should potassium iodide be taken?**

Potassium iodide is most effective if taken within a few hours before, during, or immediately after inhalation or ingestion exposure to radioactive iodine. If taken about 4 hours after exposure, its effectiveness is diminished to about 50 percent. About 6 hours after exposure to radioactive iodine, the protective action of potassium iodide is substantially reduced. **Taking potassium iodide is supplemental to sheltering or evacuation, not a substitute.**

(Over)



**How long should potassium iodide be taken?**

One recommended dose of potassium iodide, if taken in a timely manner, is effective for approximately 24 hours. It should be taken daily until a risk of significant exposure to radioactive iodine no longer exists.

**Is it safe to take potassium iodide?**

The U.S. Food and Drug Administration (FDA) supports potassium iodide as a safe and effective method to block exposure to radioactive iodine. Treatment guidance from FDA suggests that the benefits of taking potassium iodide far outweigh the rare risk of serious side effects in a small number of people.

**What are the side effects of taking potassium iodide?**

Serious side effect incidence from a single, proper dose of potassium iodide is very low. Adults, especially those with known iodine allergy, are more likely than children to have serious side effects. The side effects include gastrointestinal disturbances, minor skin rash, and allergic reactions. In infants and children, a short-term change in thyroid hormones may occur, which only need to be monitored by a physician in case there is a need for thyroid hormone therapy. Other than the allergic reactions, other side effects would only occur after repeated or prolonged doses of potassium iodide.

**Who really needs to take potassium iodide after a radiation release?**

Infants, children, and pregnant or nursing women are at the highest risk of developing thyroid cancer after exposure to radioactive iodine and should be given first priority for treatment with potassium iodide.

**Who should not take potassium iodide?**

**Individuals who are allergic to iodine should avoid taking potassium iodide.** Persons with known thyroid diseases, such as Grave's disease, thyroiditis, and goiter, and individuals with dermatitis herpetiformis or hypocomplementemic vasculitis (rare skin conditions) should consult their physicians especially if repeated doses of potassium iodide are taken.

**When should I take potassium iodide?**

In the event of a nuclear power plant accident, the Virginia Department of Health and the Department of Emergency Management will advise people living within ten miles of a nuclear power plant on when and where they should receive their dose of potassium iodide. As with any medication, it is advisable to check with your physician or pharmacist before taking potassium iodide or before a nuclear power plant accident occurs.

**How can I obtain potassium iodide?**

The Virginia Department of Health is making one dose of potassium iodide available to people who live, work or visit within 10 miles of the Surry Nuclear Power Station located in Surry County and the North Anna Nuclear Power Station located in Louisa County. Potassium iodide also is available to the public for purchase without a prescription through Anbex, Inc. Anbex, can be contacted at (866) 463-6754 or by internet at [www.anbex.com](http://www.anbex.com).

RECOMMENDED DOSAGE FOR POTASSIUM IODIDE	
Adults over 18	130 mg – 1 tablet
Children over 3 years through 18*	65 mg – 1/2 tablet
Over one month through 3 years	32 mg – 1/4 tablet
Birth through one month	16 mg – 1/8 tablet

\* Adolescents approaching adult weight (~ 150 pounds) should receive the full adult dose of 130 mg or one tablet.

Prepared by: Khizar Wasti, Ph.D.  
September 12, 2002

Tab E to Appendix 8



## REPORT OF KI DECISION AND ADMINISTRATION

TRANSMISSION VIA VEOC:

\_\_\_VCIN \_\_\_FAX \_\_\_RADNET \_\_\_RACES \_\_\_OTHER: \_\_\_\_\_  
(IDENTIFY)

MEMORANDUM

TO: LOCAL HEALTH DIRECTOR

THROUGH: LOCAL GOVERNMENT EMERGENCY SERVICES COORDINATOR

FROM: \_\_\_\_\_  
(NAME OF HEALTH COMMISSIONER OR PERSON REPRESENTING THIS OFFICIAL)  
OFFICE OF THE COMMISSIONER OF HEALTH  
VIRGINIA DEPARTMENT OF HEALTH

SUBJECT: AUTHORIZATION TO DIRECT THE ADMINISTRATION AND IMPLEMENTATION OF POTASSIUM IODIDE-  
THYROID GLAND PROTECTIVE MEASURES FOR THE GENERAL PUBLIC AND EMERGENCY WORKERS

TIME: \_\_\_\_\_

DATE: \_\_\_\_\_

BASED ON PROJECTED/ACTUAL RELEASES OF RADIATION TO THE ENVIRONMENT AS A RESULT OF THE  
RADIOLOGICAL EMERGENCY AT THE \_\_\_\_\_  
(NAME OF FACILITY OR LOCATION)

I, THE HEALTH COMMISSIONER FOR THE COMMONWEALTH OF VIRGINIA, HEREBY AUTHORIZE LOCAL HEALTH DIRECTOR(S) IN THE  
AFFECTED LOCAL AREAS IDENTIFIED BELOW TO RECOMMEND THAT POTASSIUM IODIDE (KI) BE TAKEN BY THE GENERAL PUBLIC  
AND EMERGENCY WORKERS RESIDING OR WORKING WITHIN THE 10-MILE EMERGENCY PLANNING ZONE OF

\_\_\_\_\_  
(NAME OF FACILITY OR LOCATION)

THIS RECOMENDATION INCLUDES THE GENERAL PUBLIC AND EMERGENCY WORKERS IN THE FOLLOWING LOCAL GOVERNMENTS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

THIS ORDER APPLIES TO FIELD TEAM PERSONNEL AND EMERGENCY WORKERS IN EOCs AND IN OTHER FACILITIES LOCATED  
WITHIN THE 10-MILE EMERGENCY PLANNING ZONE OF \_\_\_\_\_  
(NAME OF FACILITY OR LOCATION)

THE GENERAL PUBLIC SHOULD TAKE THE KI DOSEAGE IN ACCORDANCE WITH THE STATE AND LOCAL RADIOLOGICAL EMERGENCY  
RESPONSE PLANS FOR KI ADMINISTRATION AND AS DIRECTED BY HEALTH DEPARTMENT PERSONNEL. WHEN USED EFFECTIVELY,  
KI CAN BLOCK THE UPTAKE OF RADIOIODINES BY THE THYROID GLAND.

EMERGENCY WORKERS SHOULD TAKE ONE KI TABLET DAILY NOT TO EXCEED ONE TABLET PER DAY UP TO TEN DAYS. WHEN USED  
EFFECTIVELY, KI CAN BLOCK THE UPTAKE OF RADIOIODINES BY THE THYROID GLAND.

THE COMMISSIONER OF HEALTH WILL MODIFY OR TERMINATE THIS ORDER BASED ON THE SEVERITY OR MITIGATION OF THIS  
RADIATION ACCIDENT.

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Tab F to Appendix 8  
EVACUATION ASSEMBLY CENTERS (EACs) – SPS and NAPS

SURRY POWER STATION

Isle of Wight County:	Smithfield High School Windsor High School
James City County:	Charles City County School Complex Hampton Coliseum
Surry County:	Surry County High School Surry County Elementary School L.P. Jackson Middle School
York County:	Tabb High School Grafton Middle School/High School Complex Poquoson High School New Kent County High School
City of Newport News:	Warwick High School Huntington Middle School Gildersleeve Middle School South Morrison Elementary School
City of Williamsburg:	New Kent County High School New Kent County Middle School

NORTH ANNA POWER STATION

Caroline County:	Caroline County High School Caroline County Middle School
Hanover County:	Liberty Middle School Patrick Henry High School* (host school for Louisa County)
Louisa County:	Trevillians Elementary School Patrick Henry High School*
Spotsylvania County:	Courtland High School Chancellor High School Massaponax High School
Orange County:	Orange County High School Prospect Heights Middle School

Appendix 9:  
PUBLIC INFORMATION

I. MISSION

- A. Conduct ongoing public information programs to educate the public on potential hazards, how they will be notified, and what actions they should take in the event of an emergency at a fixed nuclear facility
- B. Provide the news media and the general public with information on the status of a radiological emergency and protective actions implemented by governmental authorities.

II. OPERATIONAL CONCEPTS AND PROCEDURES

A. Concept of Operations

1. Non-Emergency Periods

- a. The operator of a fixed nuclear power station will develop, in cooperation with the Virginia Department of Emergency Management (VDEM), information on how, appropriate personnel and agencies will be notified and what actions should be implemented in the event of an emergency at the fixed nuclear facility. Information will be provided annually to the permanent population residing within the plume exposure (ten-mile) Emergency Planning Zone. The information is made available to transients by way of yellow page advertisements. This information shall include, as a minimum:

- (1) Educational information on the radiation hazard.
- (2) Contacts for additional information.
- (3) Protective measures, e.g., evacuation routes and Evacuation Assembly Centers, sheltering, respiratory protection.
- (4) Actions to be taken when evacuation is ordered.
- (5) Needs of special needs individuals.
- (6) Public warning procedures; use of Emergency Alert System (EAS).

Means of dissemination may include: information in telephone directories, periodic information in utility bills or by separate mailings, posting in public areas, newspaper inserts, and publications distributed on an annual basis.

- c. The State will assist local governments in their radiological information programs as requested by the emergency services coordinator.

## 2. Radiological Emergency

Local governments are responsible for informing the public (residents, transients, institutionalized) in the area where a radiological accident has occurred of the emergency and of any protective actions to be taken. Attention will be given to the special needs of the elderly and handicapped. Pre-scripted messages may be used to facilitate timely and accurate dissemination of the emergency information through the media. Arrangements should be made with the EAS station for EAS messages to be rebroadcast periodically. These messages should include the following, as applicable:

- a. Plant status (emergency classification level and reference to any potential or actual release).
- b. Protective actions to be implemented (shelter, evacuation, etc.).
- c. Protective Action Zones affected (zone numbers and geographical description).
- d. Evacuation Routes.
- e. Evacuation Assembly Centers opened.
- f. Protective actions with respect to livestock.
- g. Reference to the Emergency Planning Information Calendar.
- h. Request for the public both within and outside the affected area to stay tuned to the EAS station.
- i. Information to counter any rumors, if necessary.

## III. JOINT INFORMATION CENTER

- A. A Joint Information Center will be established, manned, and operated jointly by the licensee/NNPP facility and the State. The JIC for radiological accidents involving the North Anna or Surry Power Station will be located at the Virginia Emergency Operations Center in Richmond, Virginia. The JIC for Norfolk Naval Shipyard will be at Drydock Club at Scot Center Annex, Portsmouth, Virginia. The JIC for Northrop Grumman Newport News will be at the Advanced Shipbuilding and Carrier Innovation Center (VASCIS), Newport News, Virginia. State and utility/NNPP staff at the JIC will be responsible for providing timely and accurate information, concerning an emergency to the media.

Media briefings will be held on a regularly scheduled basis or as emergency conditions warrant. During these briefings the media will be given information on the following, as applicable:

1. Plant conditions.
  2. Protective Action Decisions.
  3. How to maximize protection when sheltering;
  4. Instructions for transients without shelter; what to take when evacuating;
  5. Evacuation routes;
  6. Location of evacuee assembly centers;
  7. Information and instructions for parents of students concerning protective actions for students;
  8. Information for transportation-dependent individuals and special populations;
  9. Information and instructions on protective actions for ingestion, such as actions to be taken with livestock;
  10. Relocation, re-entry, or return; rumor control telephone numbers;
  11. Use of the Emergency Information Planning Calendar.
- B. Public telecommunications capabilities to accommodate news media representatives will be established at the JIC.

#### IV. LOCAL MEDIA SUPPORT

In the event of a radiological emergency, information and instructions will be disseminated to the public through the stations as identified in Appendix 10, Communications, paragraphs IV.G.1. and IV.G.2, and local government plans.

Attachments:

Tab A- Emergency Communications Committees and Operational Areas

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Tab A to Appendix 9

EMERGENCY COMMUNICATIONS COMMITTEES AND  
OPERATIONAL AREAS

STATE EMERGENCY COMMUNICATIONS COMMITTEE (SECC)

The Federal Communications Commission appoints the State Emergency Communications Committee (SECC) Chairman and Vice-Chairman. SECC members include the Chairmen and Vice-Chairmen of the Operational Area Emergency Communications Committees and other voluntary members appointed by the SECC Chairman.

OPERATIONAL AREA EMERGENCY COMMUNICATIONS COMMITTEES (OAECC)

The Operational Area Emergency Communications Committee (OAECC) Chairman and Vice Chairman are appointed by the Federal Communications Commission. The OAECC Chairman appoints members on a voluntary basis. The OAECC's are also subcommittees of the State Emergency Communications Committee (SECC) and all OAECC Chairmen and Vice Chairmen are members of the SECC.

VIRGINIA STATE RELAY NETWORK

Originating Primary Relay Stations:

WRVA (AM), WRVQ & WRXL (FM) Richmond

Primary Relay Stations:

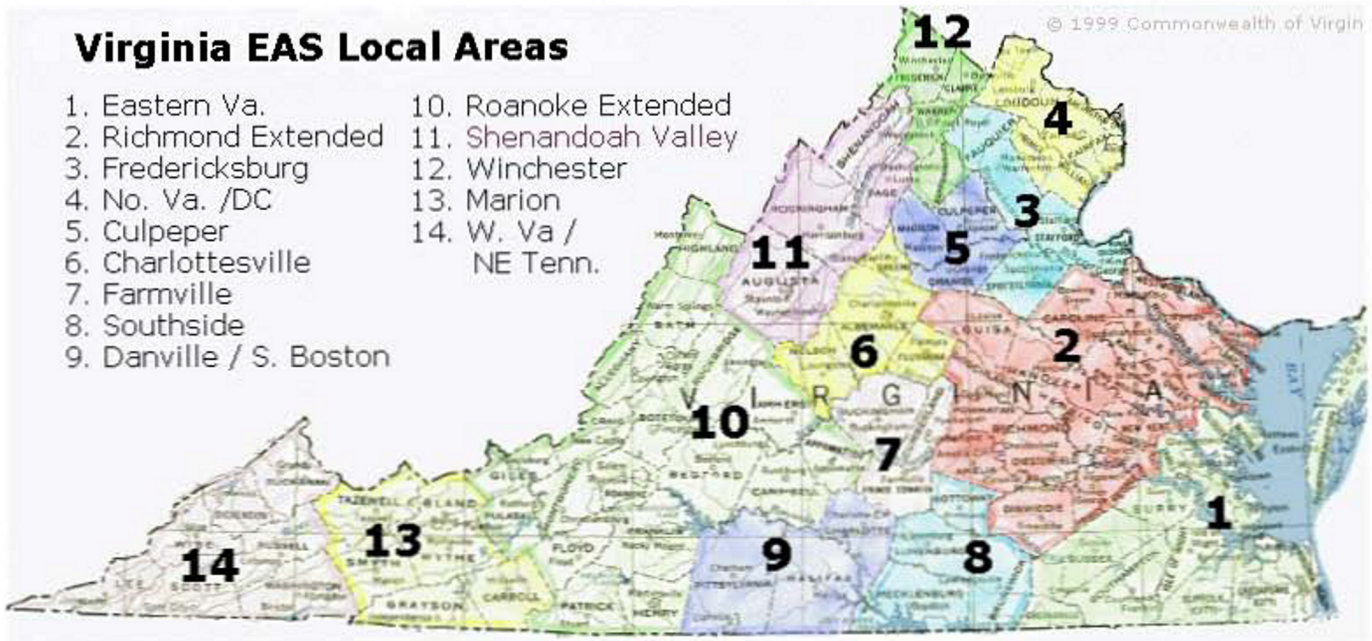
WJMA (FM)	Orange
WFLS (FM)	Fredericksburg
WGH (FM)	Virginia Beach
WCHV (FM)	Charlottesville
WRVA (FM)	Richmond
XM Digital Radio	Washington D.C.
WSHV (FM)	South Hill
WBTM/WAKG (FM)	Danville
WVTF (FM)	Roanoke
WMRA (FM)	Harrisonburg
WVTF (FM)	Roanoke
WXBQ (FM)	Bristol



Attachment 1 to Appendix 9 (continue)

THE VIRGINIA EAS HOMEPAGE

EAS information is constantly changing. As such the URL provided below will serve as the most up-to-date resource for EAS information for local officials. The VIRGINIA EAS HOMEPAGE is constantly revised and well maintained. The web address is as follows: <http://www.jmu.edu/wmra/eas/frederic.html>. Critical information should be downloaded and distributed on a regular basis, as this information is likely to change regularly. The following map illustrates Virginia's EAS local areas as provided on the EAS Homepage.



Source: <http://www.jmu.edu/wmra/eas/frederic.html>.

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Appendix 10:  
COMMUNICATIONS

I. MISSION

The communications mission is to:

- A. Transmit emergency information in support of radiological emergency response operations.
- B. Transmit warning, weather, and intelligence information.
- C. Alert and activate emergency personnel in each response organization.

II. OPERATIONAL CONCEPTS AND PROCEDURES

A. Concept of Operations

- 1. VDEM will coordinate communications on the State level during a radiological emergency on a 24-hour basis.

B. Means of Communication

- 1. The primary means of communication, to include reports on the four classes of emergency action levels from nuclear facilities, will be by Instaphone and commercial telephone systems (common user, CTS, and full-time point-to-point circuits).
- 2. Back-up communications for direction and coordination of radiological emergency response will be by: internet, and/or radio, and or cellular.
- 3. Back-up communications for warning of those local governments (ingestion pathway jurisdictions) not immediately affected by the radiological emergency will be by commercial telephone, VCIN ,VAWAS, internet, or cellular.
- 4. Back-up communications between the Virginia EOC and either the Surry Power Station or the North Anna Power Station will be by radio, or cellular.
- 5. Supporting State agencies with a communications capability will utilize their own systems in the execution of assigned missions in connection with response to a radiological emergency. Where feasible and as requested by the

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Virginia Department of Emergency Management, these State agencies will provide support communications to State agencies lacking such a capability.

6. Commercial telephone will be the primary means of communications for exchange of information concerning radiological emergencies between the Virginia EOC and the State of Maryland (See Section IV.H. below). Back-up communications for this purpose will be by commercial telephone and the FEMA National Radio System (FNARS) or (NAWAS). Similar requirements between the State EOC and the State of North Carolina will be by:
  - a. Commercial Telephone
  - b. Federal National Radio System (FNARS)
  - d. NAWAS
  - e. Best available means.
7. Commercial telephone will be used as the primary means of communication between the Virginia EOC and Federal emergency response organizations. FNARS, NAWAS or other best available systems, will be used as back-up means for this purpose.
8. For Federal emergency communications assistance, see C.4. below.
9. VDEM will provide coordination communications in support of the Emergency Alert System (EAS).

C. Channels of Communications

1. Notification of Radiological Emergency (See Section III.D.).
  - a. From fixed nuclear facility to State and local EOCs by Insta-phone.
  - b. From fixed nuclear facility (EOF) to Virginia EOC by ring-down system.
2. Radiological Response Team Communications
  - a. Radiological Monitoring Teams
    - (1) Local Radiological Monitoring Teams will be supplied with vehicles and radios by the respective local governments. These

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teams are composed of police, fire, rescue, other local government employees, and volunteers who will use radios available within their organizations or as provided by the local government.

- (2) Communications will be from the local monitoring teams to the local EOC and from the local EOC to the EOF or to the Virginia EOC until the EOF is operational. The local EOC will submit monitoring reports directly to the State Radiological Assessment Officer located there.
- (3) The VDH Radiological Emergency Response Team (RERT) will dispatch State radiological monitoring teams to the affected area to take readings and report them via radio to the BRH Radiological Assessment Officer located at the EOF. These activities will be integrated into a single radio communications net with the Radiological Assessment Officer at the EOF serving as the net control station (See Tab B).

b. State Radiological Operations Officer

The BRH Health Radiological Operations Officer will operate from the Virginia EOC. He can monitor local radiological monitoring teams and State monitoring teams through the Radiological Assessment Officer at the EOF by telephone.

3. Local Requests for Assistance

Requests for assistance will be submitted from local EOCs to the Virginia EOC. Commercial telephones will be employed as the primary means, with radio, using nets established by the RACES, Civil Air Patrol, or State agencies as the secondary means.

4. Federal Emergency Communications Assistance

- a. Requests for Federal emergency communications assistance will be coordinated within the State by VDEM Communications Officer located at the Virginia EOC. He will, after verifying the need, forward requests to the Director, Region III, Federal Emergency Management Agency (FEMA) or to the Senior FEMA Official (SFO) at the Federal Response Center (FRC), if established.
- b. Federal telecommunications support to the State will be in accordance with the provisions of the National Plan for Communications Support in

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Non-Wartime Emergencies, September 1987, as revised. Federal communications assistance will be provided through FEMA. Contact Regional Emergency Communications Coordinator, Philadelphia, Pennsylvania.

#### D. Communications Systems

The following communications systems exist or will be established and available for use during a radiological emergency at a nuclear power station. When established as a result of a radiological emergency, they will be checked, as indicated, and staffed to remain operational continuously throughout the emergency.

1. Insta-Phones. Separate "insta-phone" systems provide dedicated telephone communications between the two nuclear power stations, the Virginia EOC and the political subdivisions located within the 10-mile plume EPZ. These systems are checked three times daily.
2. Ring-Down System. This dedicated system consists of a direct line between each power station and the Virginia EOC. These systems are checked weekly by Dominion and VDEM.
3. RACES and CAP. These radio nets are tested quarterly by each organization with the Virginia EOC.
4. Voice-Over-Internet-Protocol (VOIP) and internet/email, satellite phones, and cellular phones. We support redundant/duplicate DS-3 (45 Mbps) connections to the Internet. One is provided by Verizon, the other by MCI. Both lines come from opposite geographical locations and terminate in physically different locations both at the EOC and with regards to where they terminate for the vendor. Additionally, we have direct T1 access to each satellite VDEM facility. The first line of defense with regards to telephones is the Voice over IP switch which is managed by Verizon – this is also redundant. Should either of the DS-3's fail, the other will pick and carry both Internet and phone services with a 20 second delay. Additionally, we have 50 analog (POTS) lines at the EOC in the event that all communications lines are down. Should that fail, we have satellite phone capability and built-in cellular repeaters to allow both cell phones and air cards to communication in both voice and data modes.

### III. TASKS

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- A. The Virginia Department of Emergency Management (VDEM) will determine requirements for, and arrange installation of communications to support radiological emergency response.
  - B. The Virginia EOC - Communications Maintenance Officer will coordinate with the commercial telephone companies on landline requirements, installation, and maintenance between state primary, regional, and local offices.
  - C. The Civil Air Patrol (CAP) will provide the primary tactical radio communications between the State Primary, Alternate, Regional, and local government EOCs as well as CAP field units in accordance with Federal rules and regulations and mutual agreements with the State.
  - D. RACES will provide the primary fixed formal message means of radio communications between State Primary, Regional, and local government EOCs in accordance with Federal rules and regulations and the State RACES Communication Plan.
  - E. VDH is responsible for insuring adequate communications between medical facilities, ambulances, and EOCs (See Tab C, Emergency Medical Communications).
  - F. The following State agencies will provide mobile emergency radio back-up communications as required:
    - 1. Department of Agriculture and Consumer Services.
    - 2. Department of Game and Inland Fisheries.
    - 3. Department of Transportation.
    - 4. Department of Military Affairs.
    - 5. Department of Motor Vehicles.
    - 6. Department of State Police.
    - 7. Department of Corrections.
    - 8. Department of Emergency Management.
  - G. Emergency Alert System (EAS)

The VDEM will coordinate EAS messages from State authorities and forward them to the Common Programming Control Station-1, WRVA, in the Richmond extended area, and WGH for the Newport News/Peninsula operational area. Local governments will submit requests for activation of the EAS to the State with one exception. If unable to contact the Virginia EOC by telephone or radio, local governments are authorized to activate the local EAS and forward emergency action messages to the Common Program Control Station for that jurisdiction. All information to be broadcast via the EAS will be disseminated in accordance with the State EAS Plan.

1. Broadcast stations serving the area around the North Anna Power Station:

TV	WTVR	Channel 6	Richmond
	WWBT	Channel 12	Richmond
	WRIC	Channel 8	Petersburg
	WVIR	Channel 29	Charlottesville
RADIO	WCVA	1490 AM	Culpeper
	WCUL	103.1 FM	Culpeper
	WFAL	104.5 FM	Falmouth
	WFVA	1230 AM/ 101.5 FM	Fredericksburg
	WYSK	1350 AM/ 99.3 FM	Fredericksburg
	WFLS	1350 AM/ 93.3 FM	Fredericksburg
	WRVA	1140 AM	Richmond
	WJMA	1340 AM	Orange
	WRNL	910 AM	Richmond
	WRVA	1140 AM	Richmond
	WRVQ	94.5 FM	Richmond
	WKLR	96.5 FM	Richmond
	WTVR	98.1 FM	Richmond
	WRXL	102.1 FM	Richmond
	WMXB	103.7 FM	Richmond
	WBTJ	106.5 FM	Richmond
	WJYJ	90.5 FM	Spotsylvania
	WGRQ	95.9 FM	Spotsylvania
	WBQB	101.5 FM	Fredericksburg

2. Broadcast stations serving the area around the Surry Power Station:

TV	WVEC	Channel 13	Norfolk
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WTKR	Channel 3	Norfolk
WHRO	Channel 15	Norfolk
WTVZ	Channel 33	Norfolk
WAVY	Channel 10	Portsmouth
WGNT	Channel 27	Portsmouth
WTVR	Channel 6	Richmond
WWBT	Channel 12	Richmond
WRIC	Channel 8	Richmond

Broadcast stations serving the area around the Surry Power Station  
(continued):

RADIO

WGH	1310 AM	Hampton
WKGM	940 AM	Smithfield
WSRV	92.3 FM	Williamsburg
WWBR	107.9 FM	Williamsburg
WRVA	1140 AM	Richmond
WRNL	910 AM	Richmond
WTVR	98.1 FM	Richmond
WBTJ	106.5 FM	Richmond
WTAR	850 AM	Norfolk
WCMS	100.5 FM	Hampton
WGH	97.3 FM	Hampton
WXEZ	94.1 FM	Hampton
WXGM	99.1 FM	Gloucester
WXGM	1420 AM	Gloucester
WCMS	1050 AM	Hampton
WVKL	95.7 FM	Norfolk
WNIS	790 AM	Norfolk
WJCD	105.3 FM	Norfolk

H. Communications with Contiguous States

VDEM will establish communications, by telephone, with the states of Maryland and North Carolina for exchange of information concerning radiological emergencies at nuclear facilities within any of the three states that might affect one of the other states. The following systems may be utilized as backups: FNARS, NAWAS.

I. Federal Agencies



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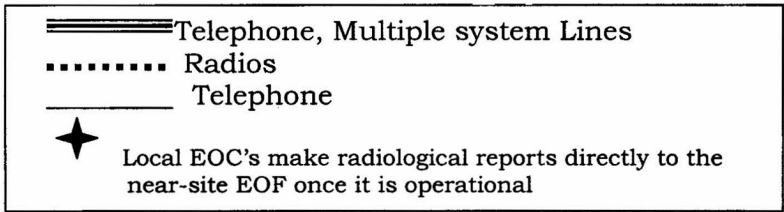
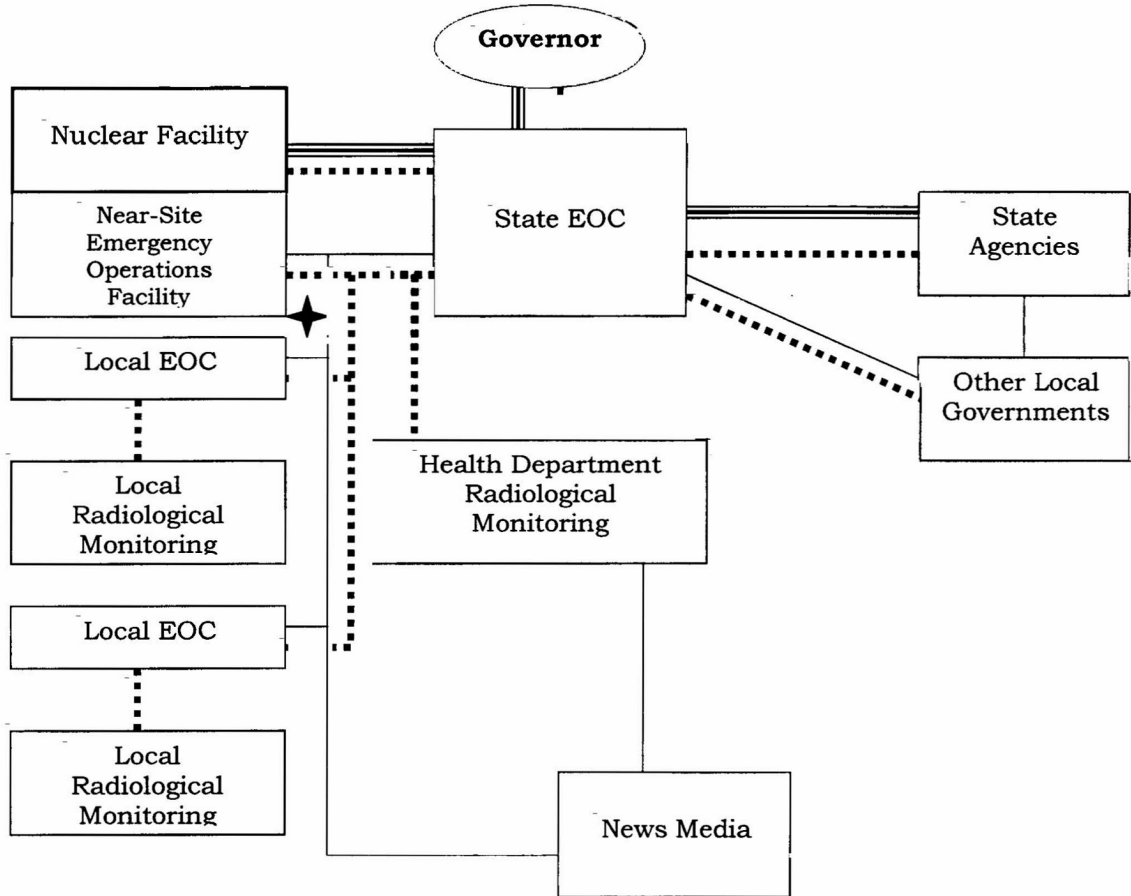
VDEM is responsible for establishing and coordinating communications with Federal emergency response organizations operating in the affected area.

Attachments:

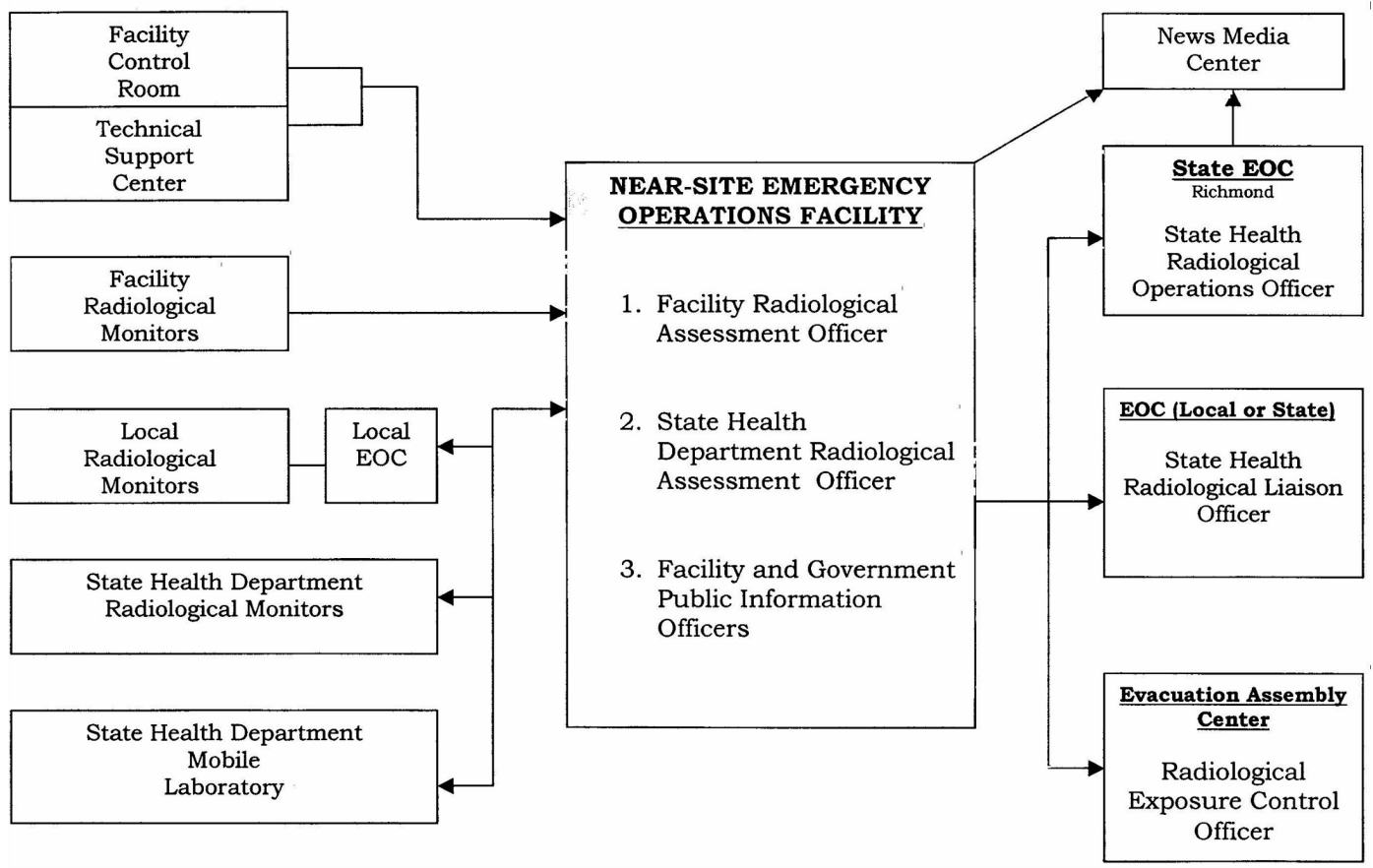
- Tab A - Radiological Emergency Response Operations
- Tab B - Radiological Data Collection, Interpretation, and Dissemination
- Tab C - Emergency Medical Communications

Tab A to Appendix 10

RADIOLOGICAL EMERGENCY RESPONSE OPERATIONS



RADIOLOGICAL DATA COLLECTION, INTERPRETATION, AND DISSEMINATION



Tab B to Appendix 10

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Tab C to Appendix 10

EMERGENCY MEDICAL COMMUNICATIONS

Radio communication capabilities of ambulances, hospitals, and other medical support activities which would respond to a radiological emergency at a fixed nuclear facility or a transportation accident involving radioactive materials are listed below.

Ambulance - Hospital. Ambulances located in the vicinity of Surry and North Anna Nuclear Power Stations are equipped with mobile radios which allow direct voice communication with local and tertiary hospitals. This communication takes place on 155.340 MHz for hospitals in the Tidewater area adjacent to the Surry Plant. Direct communications from the North Anna Station to the University of Virginia Hospital and from the Surry Station to the Medical College of Virginia Hospital are possible with the system. Vehicles of the Director and Field representatives of the Virginia Division of Emergency Medical Services are equipped with mobile radios to transmit and receive on these frequencies.

Hospital - Hospital. Hospitals in the vicinity of the two nuclear power stations which have emergency departments are equipped with base stations operating on 155.340 MHz or 155.400 MHz. Inter-hospital communications on these frequencies are possible. Selective signalling of individual hospital or simultaneous signalling of all hospitals is done by the use of interrupted tone encoders/decoders.

Other. VDEM mobile command vehicles are equipped to transmit and receive on the following frequencies:

155.340 MHz - Central Virginia Hospital Frequency

155.400 MHz - Tidewater Virginia Hospital Frequency

155.280 MHz - Tidewater Hospital to Hospital

155.205 MHz - Inter-agency Mutual Aid - EMS Statewide

155.895 MHz - Department Administrative Frequency (VDEM)

155.820 MHz - DEM Administrative Frequency

155.160 MHz - Surry and Isle of Wight Rescue Squads

Tab C to Appendix 10 (continued)

EMERGENCY MEDICAL COMMUNICATIONS

Thirty-nine (39) of the Emergency Medical Services agencies in the central Virginia area also have the inter-agency mutual aid frequency. Ambulances in the vicinity of the North Anna Power Station have the capability of communicating through a regional mobile relay system or on a district mobile-mobile frequency--155.955 MHz.

Hospital - EOC Communications. Radio contact through the regional mobile relay system is possible from the Louisa County Sheriff's Department to the University of Virginia Hospital in Charlottesville. A mobile radio stationed at the Surry Sheriff's Department can communicate with MCV in Richmond directly. The Virginia EOC can directly contact UVA and MCV via radio.

Appendix 11:  
DECONTAMINATION, RE-ENTRY, RETURN AND RECOVERY

I. MISSION

- A. To provide for the decontamination of people, vehicles, livestock, structures, crops, soil, and any other surfaces that are contaminated with radioactive material.
- B. To provide for re-entry (temporary access) and return (reoccupation) into affected areas evacuated due to a radiological emergency.
- C. To develop Recovery, Re-entry and Return Plan to address I.A. and I.B.

II. CONCEPT OF OPERATIONS AND PROCEDURES

A. Contamination Levels

An individual or surface will be considered contaminated if a survey reading indicates a level in excess of 0.1 mR/hr above background.

B. Evacuees and Emergency Workers

- 1. Evacuees and emergency workers who may have become contaminated will be monitored and, if necessary, decontaminated at an Evacuation Assembly Center (EAC) (Tab A).
- 2. Decontamination activities will be performed under the guidance of VDH.
- 3. Records of contamination levels and decontamination efforts will be recorded on Form REC-2, Individual Radiation Dose Exposure Record. This form will also be used for emergency workers (See Attachment 4, Appendix 7). These forms will be retained at the EAC until the facility is closed. The forms will then be forwarded to the local Emergency Services Coordinator.

C. Structures and Vehicles

- 1. Vehicles used by evacuees and emergency workers that have been in the evacuated area will be monitored and, if necessary, decontaminated by washing the vehicles with soap and water. This will be carried out at an EAC.

2. Structures in the affected area may have become contaminated with radioactive materials. Before return into the evacuated area is allowed, structures will be monitored and, if necessary, decontaminated by scrubbing and/or flushing with water. Decontamination may be performed by the owner of the structure after training in decontamination procedures by VDH.
3. Decontamination of structures and vehicles will be under the direction and control of a local government agency designated by the local Coordinator of Emergency Services. Advice, recommendations, and training on decontamination will be provided by VDH.

D. Crops and Soil

1. Crops and soil that may have become contaminated with radioactive materials will be monitored for contamination by members of the Virginia Department of Agriculture and Consumer Services (VDACS).
2. The Division of Consolidated Laboratory Services and the BRH mobile lab will analyze crop samples, as necessary.
3. For small areas, decontamination may be accomplished by digging up the affected area and disposed as determined by VDACS.
4. For a large area, decontamination may be accomplished by a variety of methods including plowing, soaking of soils, or some other acceptable means.
5. VDACS will monitor crops grown on land that has been decontaminated to assure that they are safe for consumption.

E. Livestock

1. Livestock in the affected area will be monitored for contamination by members of VDACS.
2. Decontamination will be conducted under the supervision of VDACS. Owners of the livestock, after suitable training, may perform the decontamination themselves.

F. Recovery, Reentry and Post Accident Operations

1. The Recovery Phase will begin when the facility terminates the radiological emergency and declares that events at the site have been down-graded and conditions stabilized. Off-site monitoring, assessment and environmental sampling will be continued until terminated by the RHP Radiological Assessment Officer or when missions have been completed.
2. State and local government officials will take whatever actions necessary to provide for the safety and economic well being of the populace and to return impacted areas to normalcy. Decisions will be made to allow general public to return to the affected areas and/or to provide relocation assistance for families unable to return to areas. Decisions may also be made to relax protective measures imposed on foods--processing, distribution and consumption--and agricultural activities.
3. During post accident operations, state and local authorities (where applicable) should be prepared to:
  - a. Identify re-entry and accident recovery assistance and resources needed to return impacted areas to normalcy.
  - b. Determine relocation and housing needs of the evacuated population.
  - c. Consider and allow limited, temporary re-entry into restricted areas and permanent return, where possible.
  - d. Determine appropriate actions relative to disposition and/or use of contaminated foods, land and property.
  - e. Continue radiological dose assessment, dose commitment, integrated dose, and health effects to the public--both short and long-term.
  - f. Conduct decontamination of selected foods, vehicles, buildings, equipment and other properties. A general recovery plan for decontamination of people, livestock, crops, soil and equipment is contained in Appendix 11.
  - g. Compile a listing of persons and property owners in the affected areas to support insurance claims and requests for financial restitution.
  - h. Develop a recovery plan which outlines procedures for:



- disposal of contaminated soils, animals and other properties (e.g., removal, shipping, storage, burial).
  - lifting or relaxing restrictions on food consumption, marketing and other economic/industrial/commercial activities.
- i. Develop a method to redirect mail deliveries to evacuees and relocated populations.
  - j. Assess the financial impact on state and local economies of restrictions placed on the sale and use of commercial foodstuffs and the curtailment of wholesale and retail marketing in affected communities.
  - k. Assess the financial impact of reduced marketability (if any) of area products as a result of the radiological emergency.
4. Monitor and determine need to control the spread of radioactive contamination by wildlife.

#### G. Procedures

1. Specific actions to be taken by the State for each of the four emergency classification levels and the Recovery, Relocation and Reentry Phase are listed in Tab A, Annex A - Direction and Control. Local government actions are contained in their respective RERPs. Although significant off-site protective actions are not required except in a General Emergency, many preparatory actions will be essential in the earlier stages of an emergency.
2. Evacuation or shelter are effective means of protecting the public from direct exposure to harmful radiation. Sheltering of the public in the affected area might be a viable option; and in some cases, is sometimes the preferred alternative. When insufficient time exists to complete an evacuation of the public prior to a major radiological release or when it is anticipated that the release will be of short duration, the public may be told to remain indoors, close windows and doors, shut off ventilation systems, and monitor the EAS for further instructions. Each local government, any part of whose jurisdiction is within the plume exposure pathway EPZ surrounding a fixed nuclear facility, will develop and maintain detailed plans for immediate evacuation of any part or all of the EPZ, as required. Under these plans, evacuees will be directed to report to a designated Evacuation Assembly

Center (EAC) located outside the ten-mile EPZ where they will be monitored for contamination, decontaminated if required, registered, and provided food and shelter temporarily until other arrangements can be made. The American Red Cross Disaster Shelter Registration Form should can be used, along with other forms reflected in local RERPs, to register evacuees. Private vehicles will be the primary means of transportation. However, local government plans will also provide for public transportation for the evacuation of persons who are non-ambulatory or who have no private means of transportation. Institutions needing assistance in evacuating their residents may request assistance from the local government. State assets will be available to provide back-up transportation support. This support will be requested from the Virginia EOC.

3. Evacuated areas will not be reoccupied until assessment of the radiological situation indicates the projected dose is within safe limits. As a rule, a minimum of 24 hours should be planned to conduct the assessment and evaluation.
4. Appendix 5 provides information on population at risk, locations of evacuation assembly centers, and evacuation routes.
5. VDH will announce recommended protective actions to reduce the possibility of contamination of individuals and milk-producing animals through the ingestion pathway based on accident assessment.
6. The operator of a fixed nuclear facility may evacuate non-essential on-site personnel to either primary or secondary remote assembly areas.

#### H. Recovery Planning

1. After conditions on-site have stabilized, immediate public health and safety and property protective actions have been accomplished, and the off-site contamination characterized and its extent determined, recovery planning will be initiated. Recovery planning will focus on the following issues:
  - a. Assistance and resources needed to return impacted areas to normalcy.
  - b. Relocation and housing needs of the evacuated population.
  - c. Conditions for temporary re-entry and permanent return into restricted areas.
  - d. Appropriate actions relative to contaminated foods, land and property.

- e. Continued radiological dose assessment, dose commitment, integrated dose, and health effects to the public--both short- and long-term.
- f. Decontamination of selected foods, vehicles, buildings, equipment and other properties.
- g. Support to persons and property owners in the affected areas for financial restitution.
- h. Plan and procedures for (1) disposal of contaminated soils and other properties and (2) conditions by which restrictions on food consumption, marketing and other economic/commercial activities may be relaxed.
- i. Coordination with counties and adjacent states affected by radioactive contaminants, the exposure time periods, activity levels, and significance of radiation exposures.
- j. Redirection of mail deliveries to evacuees and relocated populations.
- k. Financial impact of restrictions placed on the sale of commercial foodstuffs and the curtailment of wholesale and retail marketing in affected communities.
- l. Continue to monitor and control the spread of radioactive contamination of both humans and animals.
- m. Ongoing public information outreach effort.

I. Re-Entry and Return

- 1. The decision to allow re-entry and return into an evacuated area rests with the Director of Emergency Services of the local jurisdiction affected.
- 2. Return will normally be recommended by VDH only when the projected dose is less than 2 Rem during the first year. This dose is the sum of the effective dose equivalent from external gamma radiation and committed effective dose equivalent from inhalation of resuspended materials. Additionally, doses in any single year after the first should not exceed 0.5 Rem and the dose over 50 years excluding the first and second years, not exceed 5 Rem.

3. Individuals who are permitted to reenter a restricted zone to work, or for other justified reasons, will require protection from radiation. Such individuals should enter the restricted zone under controlled conditions in accordance with dose limitations and other procedures for control of occupationally-exposed workers. Ongoing doses received by these individuals from living in a contaminated area outside the restricted zone need not be included as part of this dose limitation applicable to workers. In addition, dose received previously from the plume and associated groundshine, during the early phase of the nuclear incident, need not be considered.
  - a. Individuals reentering a restricted area will be registered, issued a permit and given a briefing on hazards. See Tab B for briefing outline. See Tab C for Re-entry Log and Tab D for Re-entry Pass.
  - b. Individuals permitted temporary re-entry will be issued dosimetry so that their exposure can be recorded.
  - c. These exposure readings will be recorded on the evacuee's Form REC-2.

### III. LOGISTICS

#### A. Decontamination Equipment

1. The use of ordinary soap and water will be the primary method of decontamination. If more extensive decontamination methods are required VDH will be consulted.
2. Radiation detection equipment used by local emergency services personnel to monitor a surface for contamination will be supplied through VDEM. Training in the use of this instrumentation and maintenance of the equipment will be provided by VDEM.
3. The Department of Corrections will provide, upon request, emergency clothing and shoes for use by evacuees whose clothing has been contaminated.

#### B. Decontamination Assistance

1. The Department of Energy and the Environmental Protection Agency are the primary Federal agencies to contact for decontamination assistance.
2. The need for other assistance will be determined by VDH.

Attachments:

- Tab A - Evacuation Assembly Centers
- Tab B - Sample Reentry Briefing Outline
- Tab C - Re-entry Log
- Tab D - Re-entry Pass

Tab A to Appendix 11

EVACUATION ASSEMBLY CENTERS

Surry Power Station

<u>Jurisdiction</u>	<u>Evacuation Centers</u>
Isle of Wight County	Smithfield H.S. (16) Windsor H.S. (23)
James City County	Charles City School Complex (24)* Hampton Coliseum (19)~
City of Newport News	Warwick H.S. (15) Huntington M.S. (20) Deer Park E.S. (15) South Morrison E.S. (16)
Surry County	Surry County H.S. (13.7) Surry County E.S. (13.7) L.P. Jackson M.S. (13.7)
City of Williamsburg	New Kent H.S. (30)@ New Kent M.S. (28)@
York County	Tabb H.S. (15) Grafton M.S./High School Complex (13) Poquoson H.S. (18)+ New Kent H.S. (30)@

\* Located in Charles City County; available by Mutual Support Agreement.

~ Located in City of Hampton; available by Mutual Support Agreement.

@ Located in New Kent County; available by Mutual Support Agreement.

+ Located in City of Poquoson; available by Mutual Support Agreement.

( ) Distance in Miles from Surry Power Station.

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Tab A to Appendix 11 (continued)

EVACUATION ASSEMBLY CENTERS

North Anna Nuclear Power Station

<u>Jurisdiction</u>	<u>Evacuation Center</u>
Caroline County	Caroline County M.S. (15) Caroline County H.S. (16)
Hanover County	Liberty Jr. M.S. (24)
Louisa County	Trevilians E.S. (19)
Orange County	Orange County H.S. (20) Prospect Heights M.S. (21 )
Spotsylvania County	Courtland H.S. (17) Chancellor H.S. (20) Massaponax H.S. (29)

( ) Distance in Miles from North Anna Power Station.

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Tab B to Appendix 11

SAMPLE RE-ENTRY BRIEFING\* OUTLINE

- I. NATURE OF EMERGENCY
  - A. Area Evacuated
  - B. Source of Release
  - C. Exposure Limits
- II. RADIOLOGICAL RISKS
  - A. Short Term Effects, e.g. radiation sickness.
  - B. Long Term Effects, e.g. higher risk of cancer, genetic defects.
- III. EXPOSURE REDUCTION
  - A. External Hazards - Time, Distance Shielding
  - B. Internal Hazards - Ingestion, Inhalation, Absorption
- IV. RADIATION MONITORING
  - A. Dosimetry Use
  - B. Survey monitoring at Facility - Decontamination if necessary.
- V. REGISTRATION AND RE-ENTRY PERMIT PROCESS

\* Conducted by Local Government Radiological Officer with advice by or in conjunction with State BRH Specialists.





Tab D to Appendix 11

<b>RE-ENTRY PASS</b>	
PASS #: _____	
-You have requested to enter an evacuated area.	
-You must present this pass to law enforcement officials when requested.	
-Remember the following information given to you during the briefing:	
<ol style="list-style-type: none"><li>1. NO eating, drinking, or smoking in the evacuated areas.</li><li>2. DO NOT spend any more time than you have to in the evacuated area.</li><li>3. DO NOT remove livestock or produce from the evacuated area.</li></ol>	
-Return to the facility that issued you this pass before the expiration time.	
<u>EXPIRATION</u>	
DATE: _____	FACILITY: _____
TIME: _____	

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Appendix 12:  
EMERGENCY HIGHWAY OPERATIONS

I. MISSION

The Virginia Department of Transportation along with state and local law enforcement agencies will assist with traffic control in the event of a radiological emergency, in accordance with the Highway Laws of Virginia and the policies of the State Highway Commission.

II. OPERATIONAL CONCEPTS AND PROCEDURES

The Virginia Department of Transportation shall:

- A. Provide back-up communications to support emergency response activities.
- B. Suspend operation of the Jamestown Ferry on the recommendation of the Virginia EOC.
- C. Assist in traffic control during the emergency phase of a radiological emergency by installing barricades and traffic signs as indicated below when requested by the Virginia EOC and/or a local EOC.
  - 1. Surry Power Station Area:
    - a. Radiological Emergency in Sectors A, B, C, D, E, F, Q, or R:
      - (1) Install signs on Route I-95, southbound lanes, north of Route 17 in Stafford County. Sign to advise motorists that I-64 is closed between Richmond and Williamsburg. Detour by Route 17 to Norfolk and Virginia Beach (Fredericksburg residency).
      - (2) Install signs on Route I-95, northbound lanes and southbound lanes and Route I-64 eastbound lanes in Richmond. Advise motorists that I-64 is closed west of Williamsburg (Sandston residency).
      - (3) Install signs on I-64, eastbound lane at Route 33 interchange, advising motorists that I-64 is closed west of Williamsburg (Sandston residency).

- (4) Install signs on Route I-64, east of Route 17, in Newport News. Advise motorists traveling north and west to follow Route 17, to Fredericksburg (Williamsburg residency).
  - (5) Install signs at the intersection of Route 5 and Route 156 in Charles City County advising motorists that Route 5 is closed west of Williamsburg (Sandston residency).
- b. Radiological Emergency in Sectors H, J, K, L, M, N, or P:
- (1) Install signs at the intersection of Route 10 and Route 156 in the City of Hopewell. Advise motorists that Route 10 is closed west of Smithfield (Petersburg residency).
  - (2) Install signs at the intersection of Route 156 and Route 10 east of Hopewell. Advise motorists that Route 10 is closed west of Smithfield (Petersburg residency).
  - (3) Suffolk residency to install barricades on roads in Isle of Wight County at locations shown on map at Tab A.
  - (4) Waverly residency to install barricades on roads in Surry County at locations shown on map at Tab A.
  - (5) Williamsburg residency to install barricades on roads north of the James River at locations shown on map at Tab A.
2. North Anna Power Station Area:
- a. Each risk jurisdiction around the North Anna Power Station would be supported by one primary Virginia Department of Transportation residency shop. Those primary residency shops are listed below. Any additional support would be requested through the Virginia EOC.
    - (1) Caroline County - Ladysmith residency.
    - (2) Hanover County - Ashland residency.
    - (3) Louisa County - Louisa residency.
    - (4) Orange County - Rhoadsville residency.

(5) Spotsylvania County - Post Oak residency.

- b. During an emergency, traffic control points would be established to facilitate the evacuation of the general public. The preplanned traffic control points for each North Anna jurisdiction are listed in Annex B. Louisa and Spotsylvania Counties implement a traffic control strategy based on meteorological conditions and Protective Action Recommendations from the State. Only certain traffic control points from those listed in Annex B would be activated at any one time. Caroline, Hanover, and Orange Counties, each with only one protective action zone would activate their traffic control points if their respective zone was affected. For more information, see the applicable local plan.
- c. Once an evacuation has been completed, access control points would be activated to secure access to the affected area. Only authorized personnel would be permitted entry. The preplanned access control points for each North Anna jurisdiction are listed in Annex B. Louisa and Spotsylvania Counties implement an access control strategy based on the protective action recommendation from the Virginia EOC. Only certain access control points from those listed in Annex B would be activated at any one time. Caroline, Hanover and Orange Counties, each with only one protective action zone would activate their access control points if their respective zone was affected. For more information, see the applicable local plan.

III. ADDITIONAL TRAFFIC CONTROL POSTS

- A. Situations may develop which require traffic control posts to be established other than those preplanned locations. When this occurs, an additional requirement will be placed on the Virginia Department of Transportation for barrier materials and the State Police for traffic control personnel by the local Sheriff's Department and law enforcement personnel. Precise locations for these traffic control posts will be identified by the Sheriff's and/or Police Department. The requirement should be coordinated with the Virginia EOC. These additional requirements should not affect the positioning of barricades and traffic signs as prescribed by paragraph II., this Appendix.
- B. Barricade State-maintained roads in any area of the State which may be affected by a radiological emergency. Precise locations for these traffic control points will be identified by the Virginia State Police and local emergency services personnel, in coordination with the Department of Emergency Management.

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Appendix 13:  
TRAINING AND EXERCISES

I. MISSION

To provide for exercises, drills, and training to assure the adequacy and update of the plans and to develop and maintain the skills needed at both the State and local levels for an adequate off-site response to a nuclear power station or other radiological emergency. The Virginia Department of Emergency Management (VDEM) Radiological Emergency Response and Planning (RERP) Branch will coordinate all Radiological Emergency Preparedness (REP) related training and exercises.

II. OPERATIONAL CONCEPT AND PROCEDURES

A. Full-Scale Exercise

A full-scale State nuclear power plant exercise will be conducted at least once each year, alternating between the North Anna Power Station and the Surry Power Station areas, which will be on a biennial schedule. Participants will include the radiological emergency response organizations of State and local governments, volunteer organizations and the respective nuclear power station. At least once during a 12 year cycle, the biennial full-scale exercise will include an ingestion exposure pathway exercise element. These exercises will include mobilization of State and local personnel and resources adequate to verify the capability to respond to an accident scenario. Lessons learned during the conduct or critique of the exercise will be incorporated into future revisions of State and local Plans or operational procedures. The exercise will provide for testing evacuation traffic control procedures and capability, radiological instruments, equipment, warning systems, and communications; training of emergency response personnel; and evaluation of standard operating procedures. Exercises shall be conducted as set forth in NRC and FEMA rules and guidelines.

1. The scenario for each statewide exercise shall include, but not be limited to, the basic objectives, exercise period or window, simulated accident description, participating organization, extent of play and action points. See Section II.D. below.

2. The exercise scenario will be varied from year to year such that all major elements of the plans and preparedness organizations are tested within a six-year period; the State shall make provisions to start an exercise between 6:00 p.m. and 6:00 a.m. or on the weekend once every six years; exercises will be conducted under various weather conditions; and some exercises will be unannounced.
3. The following specific required training activities or drills will be accomplished in conjunction with the exercises, as applicable:
  - a. Assure adequate communications.
    - (1) Between the Virginia EOC, the EOF, local EOCs within the ten-mile EPZ, field monitoring teams and the JIC.
    - (2) From the Virginia EOC to Federal response agencies, the State of Maryland EOC, and the State of North Carolina EOC.
  - b. Test emergency medical response of rescue squads and hospitals.
  - c. Evaluate off-site radiological monitoring and sampling capabilities of the State Health Department, the Department of Agriculture and Consumer Services, and the Department of Environmental Quality.
  - d. Evaluate local radiological monitoring capabilities.
4. Evaluation and Critique
  - a. Qualified observers from Federal, State, or local governments will observe and critique exercises or drills. The critique shall be conducted as soon as practicable after the exercise, and a formal evaluation should result.
  - b. State agencies and local governments will ensure that recommended corrective actions are implemented. Deficiencies noted at the exercise critique will be corrected by a follow-up or remedial exercise within 120 days of the finding.

## B. Small-Scale Exercise

At least one partial participation exercise will be conducted during the year at each licensed nuclear facility where a full-scale off-site exercise is not conducted. These exercises will be designed to test the adequacy of communication links, assure that response agencies understand the emergency classification levels, and test other elements of the off-site emergency response plans. Selected State agencies, the licensee, and local governments within the plume exposure pathway EPZ will participate in these exercises.

## C. Drills

Periodic drills will be conducted to develop and maintain key radiological response skills. The following types of drills, with frequencies as indicated, will be conducted.

### 1. Communication Drills

Communications between the nuclear facility, the State, and local governments within the plume exposure pathway EPZ will be tested daily. Communications with Federal emergency response organizations and states within the ingestion pathway EPZ shall be tested quarterly. Communications between the nuclear facility, State, and local Emergency Operations Centers, and field assessment teams shall be tested periodically.

### 2. Medical Emergency Drills

A medical services (MS-1) drill, involving a simulated contaminated individual, which contains provisions for participation by a local emergency medical services organization and hospital will be conducted annually in each nuclear facility area. The off-site portions of the medical drill may be evaluated by Federal Observers.

### 3. Radiological Monitoring Drills

Radiological monitoring drills and training sessions will be conducted annually. The drills shall include provisions for communications and recordkeeping. Local organizations will be encouraged to participate.



#### 4. Health Physics Drills

Health physics drills shall be conducted annually which involve response to, and analysis of, simulated elevated airborne and/or liquid samples and elevated radiation measurements.

#### D. Scenarios for Exercises and Drills

Scenarios and associated documents will be developed by the State and licensee to meet the FEMA and NRC criteria. These documents will assist the exercise staff, controllers, and Federal evaluators in assuring that the training exercises progress smoothly and that participants derive maximum benefits from the exercise in terms of testing response capability and training. Situations will be designed to allow free play by decision-makers. VDEM will provide advance copies of the scenario and associated documents to be employed for the exercise and identify a point of contact to assist Federal personnel administratively. The scenario and documents for use in exercises shall include, but not be limited to, the following:

1. The basic objective(s) of the exercise and appropriate evaluation criteria.
2. The date(s), time period, place(s), and participating organizations.
3. The simulated events.
4. A time schedule (chronology) of real and simulated initiating events.
5. A narrative summary describing the conduct of the exercises or drills, to include such things as simulated casualties, off-site fire department assistance, and rescue of personnel.

#### E. Training

VDEM will provide an on-going training program for instructing State and local personnel to perform necessary emergency functions. These personnel include those who would participate in emergency operations as outlined in the local Radiological Emergency Response Plans. At the State level, training will be provided for all personnel required to carry out the tasks assigned to State agencies in Appendix 2 of this Plan.

1. All State and local emergency response personnel will be offered comprehensive training through the Radiological Emergency Response Preparedness Program on a annual basis. This program includes basic response information as well as job specific training.
2. Accident assessment is the responsibility of VDH. RHP has a cadre of trained health physicists qualified to evaluate radiation emergencies at fixed nuclear facilities. These individuals will attend the one-week Radiological Accident Assessment Course at the Emergency Management Institute (EMI) where they will receive instruction in development of State and local government RERPs and evaluation of the effects of an accident at a nuclear facility. In addition, internal accident assessment training and re-training programs will be established and conducted annually. These will stress monitoring, reporting, and assessment of site-specific radiological accidents.
3. Police, security, fire fighting, first aid, rescue, and medical support personnel achieve proficiency in their primary skills through recognized on-going training programs during their professional development. Unique radiological emergency response skills are acquired through in-house training programs and programs presented by the licensee and state agencies.
4. Personnel responsible for transmission of emergency information and instructions will be trained by State agency and local department heads. Training will consist of use of notification forms, verification procedures, recordkeeping, and filing of messages. Training programs will be continuous.
5. Individuals within State agencies charged with radiological emergency response planning will undergo training to qualify them in the essential elements of radiological response planning necessary to deal with the off-site effects of an accident at a nuclear facility. Emphasis will be on development of State and local plans that meet current Federal guidelines. Training will be continuous and supervised by VDEM. Key planners will be sent to the Radiological Emergency Planning Course at EMI.
6. State agencies with radiological emergency response responsibilities will provide for the training and re-training of its own personnel in their areas of specialization.

### III. TASKS

#### A. Department of Emergency Management

1. Coordinate the overall training program.
2. Provide basic emergency training courses, conduct exercises, train radiological monitors in the use and maintenance of radiation detection equipment, and provide other specialized training as needed.
3. Provide liaison between the nuclear facilities and State and local governments to coordinate the provision of training by the facilities to emergency personnel and authorities and coordinate the facility/local community/State emergency planning interfaces.

#### B. Local Governments

1. Determine local training requirements.
2. Develop and deliver a local emergency preparedness training program for emergency services personnel.

#### C. Fixed Nuclear Facilities

1. As provided in licensee emergency plans, the licensee will provide site-specific emergency response training to State and local officials and to local emergency units which may be called upon to provide assistance in the event of an emergency. Nuclear power stations will conduct familiarization visits to the facilities as well as such other training as is agreed to by the licensee and VDEM or local governments.
2. Off-site agencies will be invited to participate in annual drills held at the fixed nuclear facilities.

#### D. Federal Agencies

Federal agencies with radiological emergency responsibilities will provide training to State and local officials within their areas of responsibility. Federal Emergency Management Agency (FEMA) contracts provide funding support to the VDEM training program.

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Appendix 14  
FIXED NUCLEAR FACILITIES

I. MISSION

To compile, in one appendix, more detailed information about fixed nuclear facilities in Virginia or within fifty miles of a Virginia border for ready reference and more rapid and appropriate response to radiological emergencies. For radiological and reactor accidents associated with Naval Nuclear Propulsion Program facilities and ships, see Appendix 16.

II. CONCEPT OF OPERATIONS AND PROCEDURES

This Plan is concerned primarily with radiological emergencies which could occur at fixed commercial nuclear power reactors located in Virginia or a contiguous state and which might have an impact on the public health and safety of Virginia citizens. The planning elements contained in this Plan, however, apply equally to all fixed nuclear facilities in Virginia. These facilities are identified at Figure 1 of the Basic Plan. The procedures for preparedness and response to a radiological accident occurring at a fuel fabrication or processing plant, or at one of the universities housing test and research reactors are essentially the same as for fixed commercial nuclear facilities. Facilities, other than commercial nuclear reactors, have lower power ratings and operating power levels and result in a total activity inventory considerably less than for a fixed commercial nuclear facility with less risk to the public. This has been recognized within the Plan by reducing the emergency planning zones for the plume and ingestion pathways to more conservative and realistic distances.

With the exception of the BWXT Mount Athos Site Complex, Lynchburg, all the fixed nuclear facilities identified in Tabs A, B and C operate under the four-level emergency classification scheme--Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency. The BWXT facility only has the potential for emergency conditions which may lead to the declaration of an "Alert" or "Site Area Emergency."

The Yorktown Naval Weapons Station, which is also a fixed nuclear facility is described in Appendix 15.

Attached as separate attachments to this Appendix is a brief summary of the fixed nuclear facilities in Virginia or within fifty miles of the Virginia border. The radiological plans for these facilities have been provided to the Virginia EOC and to adjacent political subdivisions. See Appendix 17 for a summary of NNPP facilities and ships.

Attachments:

Tab A - North Anna Power Station

Tab B - Surry Power Station

Tab C - Calvert Cliffs (Maryland) Nuclear Power Plant

Attachment 1 - Map, Calvert Cliffs Nuclear Power Plant

Tab D. U.S. Navy Nuclear Propelled Ships, Facilities and Shipyards:

This section is currently under review and revision by the U.S. Navy, Northrop Gruman, State and local officials.

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Tab A to Appendix 14

NORTH ANNA POWER STATION (NAPS)

Dominion owns and operates the North Anna Nuclear Power Station. It consists of two units (Unit 1 and Unit 2) each of which includes a three-loop pressurized light water reactor nuclear steam system and turbine generator. Each reactor unit is designed for an initial core power output of 2,893 megawatts (thermal) which results in a gross electrical output of approximately 960 megawatts (electrical). Cooling water, contained by an earthen dam structure, is obtained from the 17-mile-long Lake Anna.

1. Location

The site and exclusion area consist of approximately 1,856 acres. The units are located on a peninsula on the southern shore of Lake Anna in Louisa County approximately 40 miles NNW of Richmond, 38 miles E of Charlottesville, and 24 miles SW of Fredericksburg. Coordinates: 38,03,48 N x 77,47,13 W.

2. Population Density

Population centers of 25,000 or more within a 50-mile radius of the station site (2000) are Richmond, 40 miles SSE of the site; Charlottesville, 38 miles W of the site; and Fredericksburg, 23.5 miles NE of the site. The largest residential area within a ten-mile radius of the site is the Town of Mineral and around the Lake Anna area. The residential population within a five-mile radius as determined by using 2000 census data is approximately 6,537. The residential population to a distance of ten miles from the site using 2000 census data is about 18,782. The North Anna Station is located about 40 miles from the State of Maryland border.

3. Accident Assessment

See Appendix 6.

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Tab B to Appendix 14

SURRY POWER STATION (SPS)

Dominion owns and operates the Surry Nuclear Power Station. It, like North Anna, consists of two virtually-identical pressurized water reactors (Unit 1 and Unit 2). Each Unit is designed to be capable of attaining a maximum capacity of 2,546 megawatts (thermal), corresponding to a gross electric output of 855.2 megawatts (electrical). The reactor coolant system consists of three loops, each loop having a steam generator pump and two reactor loop stop valves. Cooling water is obtained from the James River.

Dominion also owns and operates an Independent Spent Fuel Storage Installation (ISFSI) at the site of its Surry Power Station. The function of this ISFSI is to store fuel which has been irradiated at the Surry Power Station. The ISFSI is designed to store all the spent fuel resulting from the operation of its Surry Power Station Units 1 and 2 in excess of that which can be stored in its spent fuel pool. The spent fuel is stored in dry, sealed surface storage casks. These casks are stored on concrete slabs built within the fenced-in area of the ISFSI area. The emergency planning in place for the Power Station encompass the ISFSI.

1. Location

The Surry Power Station is in Surry County, on the south shore of the James River, on a point of land called Gravel Neck, which projects into the James River from the south. There are several cities and military installations within 20 miles of the site. Coordinates: 37,10,00 N x 76,41,50 W.

2. Population Density

The cities of Hampton, Newport News, Norfolk, and Portsmouth, each with population in excess of 100,000, are located within 30 miles of the Surry plant. Significant military facilities within 20 miles with large populations are Fort Eustis in Newport News and the U.S. Naval Base in Norfolk. Other large population concentrations are tourist-oriented and include College of William and Mary, Williamsburg, Jamestown, Busch Gardens and Water Country USA within ten miles of the site. Water Country USA could have in excess of 50,000 visitors daily. The residential population within a five-mile radius of the site using 2000 census data is about 4,011. The estimated residential population within a ten-mile radius of the site using 2000 census data is 137,475.

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3. Accident Assessment

See Appendix 6.

4. Off-Site Arrangement and Support

The Surry Power Station published a revised Emergency Response Plan in accordance with NRC guidance. It provides appropriate interface with the State and contiguous local government Radiological Emergency Response Plans. Emphasis in the revision was placed on notification, communications, coordination, and support. The Plan provides for the activation of a Emergency Operations Facility (EOF) at the Training Center Building within about 90 minutes of an Alert classification. The Dominion Corporate Headquarters, Innsbrook Technical Center located in Glen Allen, Virginia will serve as the alternate EOF. A Joint Public Information Center will be established at the Dominion Innsbrook Technical Center. An early warning system has been installed by Dominion to meet the requirements of NUREG-0654/FEMA-REP-1 (See Appendix 3). Mutual support agreements exist between the Surry Power Station and local support organizations.

5. Emergency Response

In the event of an emergency at the Surry Power Station, Dominion will activate its Emergency Response Organization and emergency response procedures.

The normal organization for SPS includes the following personnel:

Station Manager

Assistant Station Manager,  
Operations & Maintenance

Assistant Station Manager,  
Nuclear Safety & Licensing



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During an Alert, Site Area Emergency or a General Emergency, the emergency response organization for SPS includes the following positions:

<u>Emergency Position</u>	<u>Filled By</u>
Station Emergency Manager	Station Management
Recovery Manager	Senior Corporate Management
Chief Technical Spokesperson	Senior Corporate Management

Aspects of direction and coordination are the same as that reflected in paragraph 5 of Tab A for the North Anna Power Station.

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Tab C to Appendix 14

CALVERT CLIFFS (MARYLAND) NUCLEAR POWER PLANT

Baltimore Gas and Electric Company owns and operates the Calvert Cliffs Nuclear Power Plant (CCNPP) which is located in Maryland about 22 miles from the Virginia border (See Attachment 1). It consists of two units (Unit 1 and Unit 2) each of which includes a three-loop pressurized light water reactor nuclear steam supply system and turbine generator. Each reactor unit is designed for a net electrical output of 845 megawatts.

1. Location and Population

The site is located at Lusby, Maryland, which is approximately 22 miles northeast of the Virginia border at its closest point. The Virginia area affected includes all or parts of the following jurisdictions:

Accomack County	Lancaster County+
Alexandria City	Middlesex County+
Arlington County	Northumberland County+
Caroline County*	Prince William County*
Essex County*	Richmond County+
Fairfax County	Stafford County*
Falls Church City	Westmoreland County*
King George County*	
King and Queen County*+	

\* Also within 50 miles of NAPS. + Also within 50 miles of SPS.

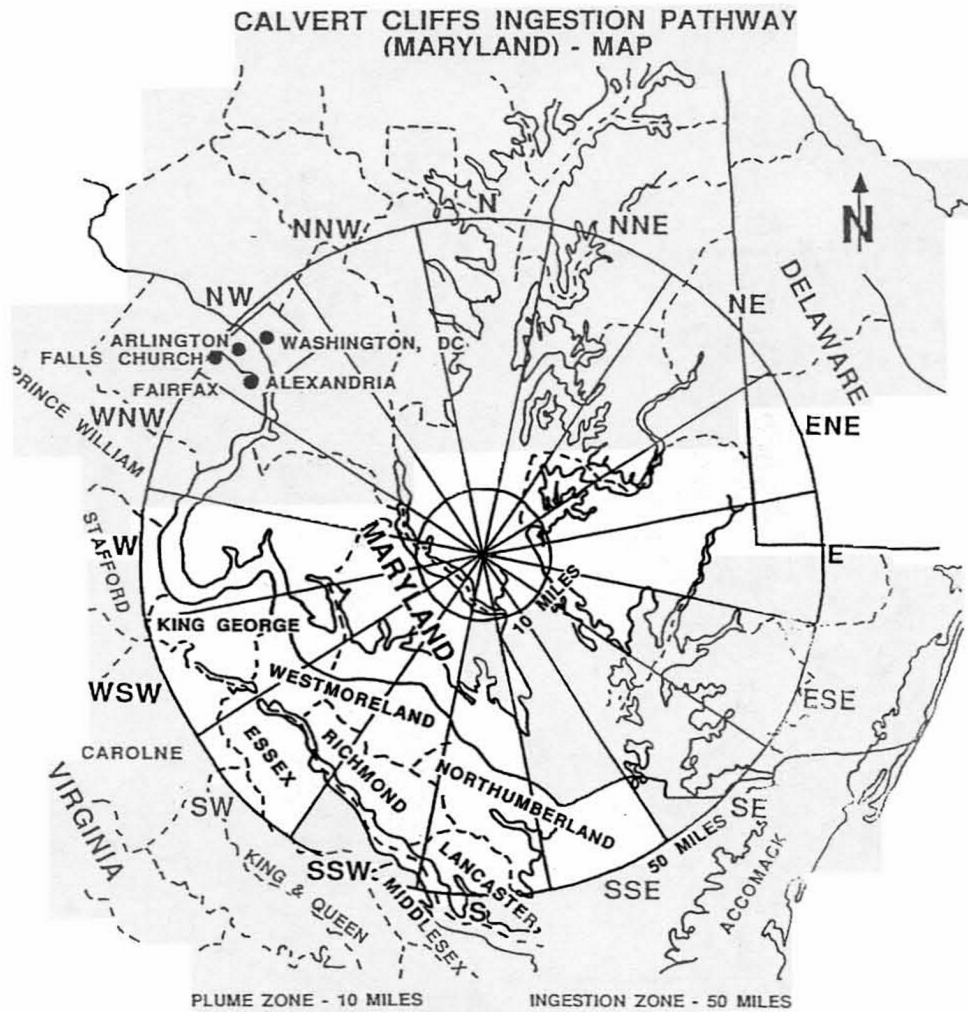
2. Accident Assessment

The discussion at Appendix 6 generally applies. A radiological accident at the Calvert Cliffs Plant with the wind direction from the northeast could result in an accidental release of radioactivity resulting in the need to pre-plan protective actions (ingestion pathway EPZ) within the areas affected. See Attachment 1 to Tab C.

3. Agreements and Response Procedures

Written agreements have been developed between the State of Maryland and the Commonwealth of Virginia to provide for timely notification, mutual support, and identification of response organizations and procedures.

Attachment 1 to Tab C to Appendix 14



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Appendix 15:  
TRANSPORTATION ACCIDENTS

I. REFERENCES

- A. Emergency Preparedness for Transportation Incidents Involving Radioactive Materials - Guidance, SAIC-89/1354, Produced for the U.S. Department of Energy by Science Applications International Corporation (SAIC), May 1990.
- B. Emergency Response Guidebook (DOT-P-5800.6), U.S. Department of Transportation, 2004.
- C. Regulations for Transportation of Hazardous Radioactive Materials, Commonwealth of Virginia, State Board of Health, February 17, 1980, as amended (now a regulation of the Virginia Waste Management Board, Department of Environmental Quality).
- D. Code of Federal Regulations, Title 49, Transportation, Parts 171-177, Hazardous Materials Regulations.
- E. The Transportation Safety Act of 1974, Public Law 93-633.
- F. 10 CFR, Part 73, Physical Protection of Plants and Materials; Part 71, Packaging and Transportation of Radiological Materials.
- G. Guidance for Developing State, Tribal, and Local Radiological Emergency Response Planning and Preparedness for Transportation Accidents, FEMA REP-5, Rev.2, November 2000.
- H. Nuclear/Radiological Incident Annex, National Response Plan, December 2004.
- I. Emergency Operations Plan, Volume 4 (Haz Mat)
- J. Emergency Operations Plan, Volume 7 (Transportation)

II. DEFINITIONS

- A. See Appendix 18 of this Plan.

III. MISSION

The mission of the State and local governments is to plan for, prepare for, and conduct response to transportation accidents involving radioactive materials.

#### IV. SITUATION

- A. Radioactive materials may be transported within the State by any of four basic modes--air, water, highway, or railroad. The majority of radioactive materials, however, will move by motor vehicle over existing road nets. The concepts and procedures delineated for transportation accidents emphasize this mode but are equally applicable for the other modes.
- B. Although the shipper and carrier bear the primary responsibility for assuring that radioactive materials are safely packaged and transported, responsibility for responding to a transportation accident generally falls to the State and local governments.
- C. A transportation accident involving radioactive materials poses a potential biological hazard not only to those involved in the accident, but also to emergency services personnel and the public in the near vicinity of the accident. Locally-available trained radiological monitors are used initially to determine the extent of radioactive contamination to protect emergency services personnel involved. Radiological health personnel who respond later provide follow-on advice and response.
- D. Response to accidents involving domestic satellites containing radioactive materials will be influenced by the concept of operations outlined in Section VI. below.

#### V. RESPONSIBILITIES

The following responsibilities supplement the detailed listing at Appendix 1, Task Assignments.

##### A. State Agencies

- 1. Board of Health, State
  - a. Serve as the governing body of the Virginia Department of Health (VDH).
  - b. Develop and update regulations governing the sources of ionizing radiation.

- c. Define hazardous radioactive materials which may constitute a significant potential danger to the citizens of the State in the event of accidental spillage or release.

2. Board of Waste Management, State

Define hazardous radioactive materials and promulgates rules and regulations for their transportation within the Commonwealth.

3. Health, Department of

- a. Act for the Board when it is not in session.
- b. Provide technical assistance and advises on radiological matters.
- c. Deploy the Radiological Emergency Response Team (RERT) for radiological assistance and response to the accident site.
- d. The Radiological Health Program (RHP) will coordinate state environmental monitoring and sampling and conduct accident assessment.

4. Emergency Management, Department of

- a. Monitor the transportation of hazardous radioactive materials within the State.
- b. Disseminate information about shipments and changes to local law enforcement agencies.
- c. In the event of an accident, deploy a State On-Scene Coordinator and establish a Joint Information Center (JIC) on or near site.
- d. Coordinate emergency response actions and communications of Federal, State, and local governments.
- e. Maintain a report summarizing the activities carried out under the regulations included at Reference, i.e.; to the Department of Waste Management, the Governor's Office, and the General Assembly at least annually.

5. Environmental Quality, Department of

Administer the hazardous radioactive materials policies of the Virginia Waste Management Board.

6. State Police, Department of
  - a. Assist in evacuation, in coordination with local officials.
  - b. Enforce access/egress provision in controlled areas, when established in coordination with local officials.
  - c. Provide traffic control.
7. Transportation, Department of
  - a. Provide barricades and signaling for access and egress of controlled areas.
  - b. Assist in traffic control.

B. Local Governments

1. Respond to radiological transportation accidents using locally available resources. Request additional assistance through the Virginia EOC.
2. Develop a plan or annex to an existing plan which responds to transportation accidents involving radioactive materials.

C. Federal Government

1. Department of Homeland Security (DHS)

DHS coordinates the overall Federal Government response to radiological Incidents of National Significance in accordance with Homeland Security Presidential Directive-5 and the National Response Plan.

2. See Tab B to Appendix 15 for table of Coordinating Agencies assigned to transportation accidents involving radiation.
3. NNPP Area Commanders may be requested to respond to an accident on public highways involving radioactive material under U.S. Navy cognizance.

VI. OPERATIONAL CONCEPTS AND PROCEDURES

A. Concept of Operations

1. Response

- a. Local government officials of the political jurisdiction in which the accident occurs are responsible for the overall response as it affects the general public. Technical guidance and assistance in the radiological aspects will be provided by VDH. The overall State response will be coordinated by VDEM.
- b. Immediate response to a transportation accident involving radioactive materials should be limited to:
  - (1) Aiding the injured.
  - (2) Preventing access to the area surrounding the accident.
  - (3) Determining action required to prevent further hazard, including evacuation of people from the immediate area if fire is involved or explosion appears likely.
  - (4) Reporting the accident in accordance with paragraph VI.A.2.a. below.
- c. Follow-on response should be in accordance with recommendations from Radiological Health personnel of VDH-BRH.

## 2. Requests for Assistance

- a. For technical assistance and advice concerning the radiation aspects:
  - (1) During duty hours (8:15 a.m. - 5:00 p.m.), Monday through Friday, call Bureau of Radiological Health, Virginia Department of Health, telephone (804) 786-5932.
  - (2) During off-duty hours or holidays, call Bureau of Radiological Health Duty Officer, telephone (804) 674-2400.
- b. For other assistance, call VDEM telephone (804) 674-2400 (day or night).

## B. Procedures

### 1. Response

- a. Initial response until it has been determined that no radiation hazard exists:



- (1) Conventional lifesaving first aid has absolute priority in the management of persons injured in a transportation accident. Do NOT move vehicles, shipping containers, or wreckage except to rescue people.
- (2) Key items identifying a potential radiation accident should be looked for. Such items include RADIOACTIVE transport placards attached to vehicles, RADIOACTIVE shipping labels attached to containers, or information obtained from the driver or victims. Unless prevented by hazardous conditions at the accident site, emergency response personnel should examine the shipping papers from the transport vehicle prior to making calls for technical assistance. These papers provide valuable information about the nature of the radioactive material involved and may be needed to provide for a proper response to a transportation accident.
- (3) Contaminated clothing should be removed except when prohibited by victim's medical condition, adverse weather, etc. If it is necessary to send an individual to the hospital, inform ambulance and other transportation personnel who will be in contact with the individual of the possibility of radioactive contamination. Also ensure that the hospital or medical facility is apprised of this fact.
- (4) Isolate and secure the accident scene. Prevent access to the surrounding area for as large a distance as practical in all directions. Keep the public at least 200 feet away from the wreckage and associated debris.
- (5) Evacuate to a 1,500-foot distance if fire is involved or an explosion is likely.
- (6) Detain for monitoring and possible decontamination persons who may have been exposed to radiation or at least obtain their names, addresses, and destinations if they cannot be persuaded to stay at the accident scene.
- (7) Locally-available trained radiological monitors may be used to determine the extent of radioactive contamination as necessary to protect emergency services personnel at the scene.
- (8) Take no further action until advised by radiological health personnel.

(9) See paragraph G, Tab A, for additional actions to be taken by response personnel at transportation accidents involving radioactive materials.

(10) See Tab B for response organization for transportation accidents.

b. Follow-on

RPH personnel or consultants to VDH will provide to local government authorities technical assistance and advice on the radiation hazard, methods of protection, decontamination, and disposition of the radioactive materials involved. The Radiological Emergency Response Team (RERT) and/or Mobile Laboratory will be dispatched if necessary.

c. Transportation of Hazardous Radioactive Materials

(1) The provisions of Title 44, Chapter 3.3, Section 44-146.30 of Authority I.A.1, (page 1), Regulations for the Transportation of Hazardous Radioactive Materials, were implemented on February 15, 1980, as amended. These regulations are promulgated by authority of the Virginia Waste Management Board and administered by the Department of Environmental Quality.

(2) The Coordinator of VDEM monitors the transportation within the Commonwealth of those radioactive materials, which may constitute a significant potential danger to the citizens of the Commonwealth in the event of accidental spillage and release. The Coordinator has developed implementing procedures for monitoring the transportation of hazardous radioactive materials in the State. The Virginia EOC, telephone performs this function within the Commonwealth.

2. Requests for Assistance

a. Requests for assistance should include:

(1) Place and time of the accident.

(2) Type of accident (air, rail, motor vehicle, ship).

(3) Quantity and chemical and physical form of radioactive materials involved. This information may be obtained by examining the bill of lading or manifest. The vehicle operator may provide this information also.

- (4) Damage to packaging of radioactive materials and, if known, any information about possible releases.
- (5) Response procedures underway and actions taken to isolate and secure the accident scene.
- (6) Name and telephone number (or communications channel identification) of individual in charge at the accident scene.
- (7) Assistance required.

b. Additional information to have for reporting should include:

- (1) Injured persons requiring lifesaving assistance and other medical care.
- (2) Weather conditions at the accident scene.
- (3) Prognosis of worsening or termination of event based on current information.
- (4) Upgraded information provided on a continuing basis.

3. Federal Assistance

- a. Military Accidents. If a transportation accident involves military materials or devices, the Operations Division, VDEM, telephone (804) 674-2400, should be notified immediately. The Virginia EOC will notify officials at the nearest military installation and the Joint Nuclear Accident Coordinating Center (JNACC) at Headquarters, Defense Nuclear Agency, Alexandria, (703) 325-2102/2103/2104. JNACC will notify and coordinate the deployment of specialized teams. Unless it is necessary to approach a nuclear weapon to rescue injured individuals, first-on-the-scene responders at such an accident should establish an exclusion zone with a radius of 2,000 feet.
- b. Multiple Hazard Situations. The presence of mixed-cargo hazardous materials is of the highest concern in regard to rail shipments. Toxic chemicals, biohazards and flammable agents can present problems of more immediate concern than radioactive materials. CHEMTREC (Chemical Transportation Emergency Center) is a 24-hour service to provide advice to those at the scene of transportation emergencies involving chemical hazardous materials.

- c. Other Assistance. As a back-up to State and local emergency response efforts, response teams consisting of Federal and contract personnel are located at most USDOE laboratories and at laboratories and offices of other Federal agencies across the country. USDOE will coordinate the Federal response upon request to provide information, advice, or assistance through the Federal Radiological Monitoring and Assessment Plan. The Virginia EOC can contact the USDOE Regional Coordinating Office at the Oak Ridge Operations Office.

Attachments:

Tab A - Transportation Accidents Involving Radioactive Materials

Tab B - Table of Coordinating Federal Agencies for incidents involving transportation of radioactive materials, as designated by Nuclear/Radiological Incident Annex, National Response Plan

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Tab A to Appendix 15

TRANSPORTATION ACCIDENTS INVOLVING RADIOACTIVE MATERIALS

A. Historical Experiences

Accident analysis and statistical surveys indicate that the most commonly encountered problem involves Type A packages in transit via highway, or mishandling during loading or unloading operations. Fortunately, there have been no known deaths, disabilities, serious injuries, or major property damage resulting from radioactive material involved in a transportation accident.

B. Classification of Accidents

Transportation accidents can be generally classified into two types: low hazard with high probability and high hazard with low probability. The low hazard with high probability accident generally involves Type A packages and would not result in a release of dangerous amounts of radioactive materials. The high hazard with low probability accident involves Type B packages which might be damaged with releases of radioactive material in very severe accidents. Type A packages must be designed to withstand only moderate degrees of stress. Structural design requirements for Type B packaging are more stringent. In either case, the radiological impact would probably be limited to the immediate vicinity of the accident.

C. Packages and Casks

1. Packaging requirements

These are based on type of radioactive material quantity, form, specific activity, and fissile properties. There are four general categories:

a. Limited Quantity Materials

Exempt from most requirements specified in Federal Regulations. No requirement for use of outside warning labels or markings for shipment. Most are shipped through the U.S. Postal Service or common carrier. They include smoke detectors, luminous dials, and some medical diagnostic kits.

b. Low Specific Activity

Low limits of radioactivity with minimal risks if contents were dispersed in an accident. Shipments may be by Type A packages or "strong tight packages". They include uranium concentrate, natural uranium, and low level waste.

c. Type A

Designed to withstand the stress of transit under non-accident conditions (e.g., rough handling). Because of the smaller quantities of material permitted in Type A packages, accidents causing damages to such packages would be unlikely to result in serious radiation hazards. They constitute the majority of shipments and must only withstand moderate degrees of stress for such conditions as heat, cold, reduced air pressure, vibration, impact, water, drugs, penetration, and compression. Includes radiopharmaceuticals, research, industrial sources, and some fuel cycle materials.

d. Type B

Designed for transport of much greater quantities of radioactive materials. In addition to meeting standards for Type B packages, they must withstand drop, puncture, thermal, and water immersion stresses that might be experienced under actual or hypothetical transportation accident conditions. They include research and industrial sources and certain fuel cycle materials.

2. Safety Tests

Tests on spent fuel casks were performed by Sandia Laboratories and other agencies. These consisted of mathematical analysis, scale-model testing, and actual accident scenario tests involving impacts of 60 to 80 miles per hour. All casks withstood the tests. To date, there have been no reports of damage to Type B or special containers involved in transportation accidents that resulted in loss of material or loss of shielding effectiveness.

D. Warning Labels and Placards

1. Labels

Three different labels are used on the external surface of packages for radioactive material. The required label is usually determined by the external radiation level or by the type and quantity of radionuclides within the package. Package labels must specify the radionuclide (contents) and quantity (curies).

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<u>Label</u>	<u>Radiation Level</u>
Radioactive - White I	Almost no radiation; 0.5 mR/hr maximum on surface.
Radioactive - Yellow II	Low radiation levels; 50 mR/hr maximum on surface, 1 mR/hr maximum at 3 feet.
Radioactive - Yellow III	Higher radiation levels; 200 mR/hr maximum on surface, 10 mR/hr maximum at 3 feet and for large shipments, regardless of radiation levels.

## 2. Placards

Motor vehicles, rail cars, and freight containers carrying Yellow III labeled packages or Highway Route Controlled Quantities of radioactive material display RADIOACTIVE warning placards. All four sides of the vehicle must be placarded. These alert response personnel to possible radiation risks. In an accident, labels and placards may be obliterated or destroyed. Response personnel should then query the driver, check shipping papers, and monitor the area to determine radiological conditions.

### E. Shipping Papers

Every shipment of radioactive material must be accompanied by properly completed and shipper-certified shipping papers (e.g., bills of lading or cargo manifests). The information required on the shipping papers will assist emergency personnel in properly responding at the scene, as well as for requesting assistance. Caution in response should be taken when there is likelihood that radiological materials are being shipped with other hazardous materials.

### F. Special Nuclear Materials and Weapons

Special nuclear materials (e.g., reactor fuel, plutonium, and nuclear weapons components) present a great potential radiological hazard because of their higher specific activity and radiotoxicity. They generally are transported with an armed escort in separate vehicles. Nuclear weapons require special attention. Because of the required sequence of arming and firing, it is highly unlikely that a nuclear weapon involved in a transportation accident would detonate. The risks consist of conventional high explosives and plutonium and their exposure to fire. Normal procedures and precautions applicable to fires should be taken. If a fire occurs and the explosives detonate, plutonium could spread and constitute a serious hazard if inhaled or ingested into the body. In the absence of a need to recover injured personnel, no attempt should be made to extinguish fires or otherwise approach a nuclear weapon involved in a transportation accident. The first responders should establish an exclusion zone with a radius of 2,000 feet and immediately notify the Virginia EOC which will activate the State Radiological Emergency Response Team and notify the Joint Nuclear Accident Coordinating Center (JNACC).

#### G. Emergency Response

Persons seriously injured in any accident need immediate emergency medical care, possibly lifesaving first aid, and transportation to a hospital. Radioactive contamination of a wound or skin is not likely to be immediately life-threatening to the accident victim and even less likely to interfere with rescue and first aid. An appropriate sequence for responding to transportation accidents follows, emergency personnel first arriving on the scene will take those actions within their capability.

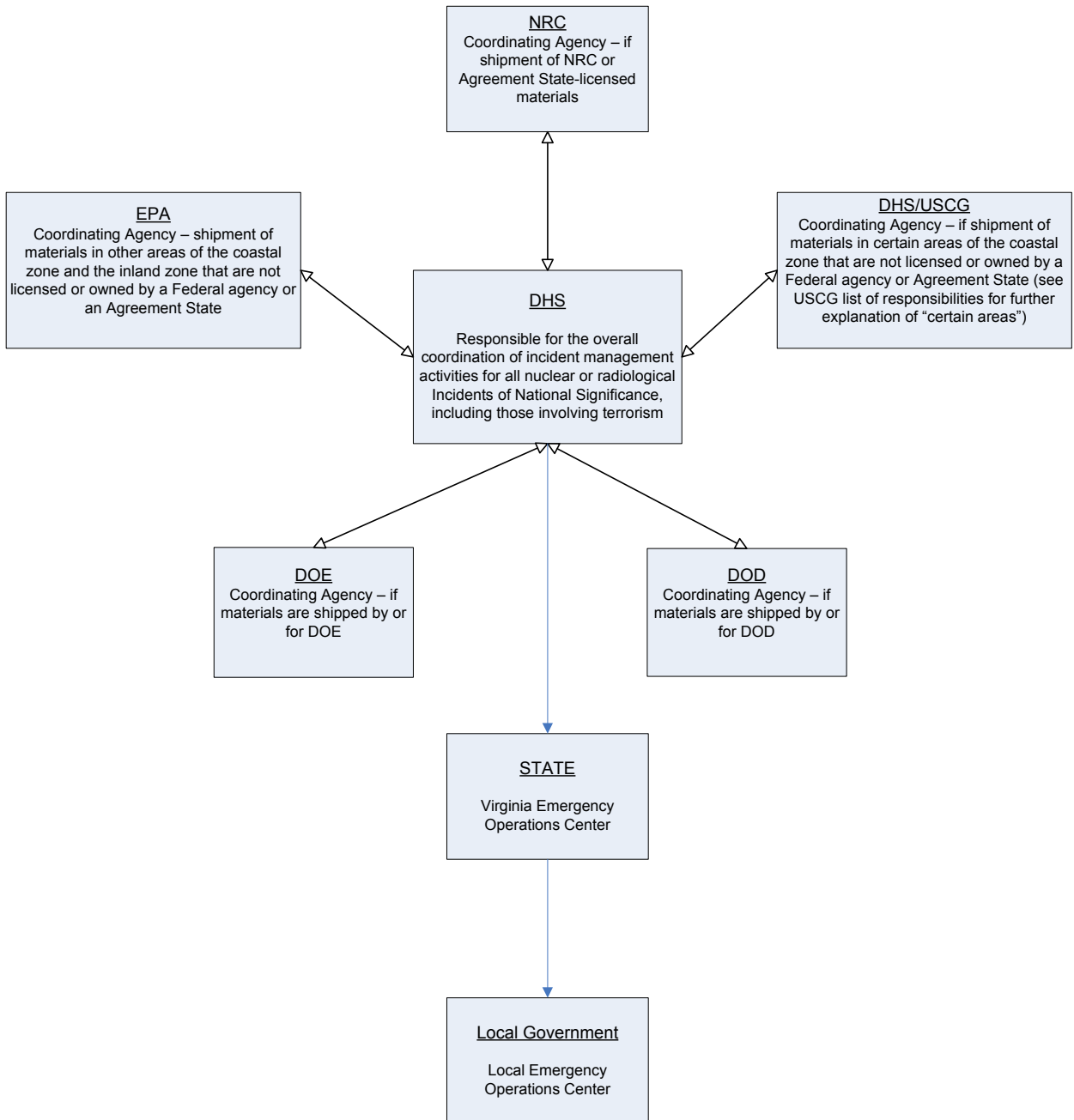
1. Park emergency vehicles upwind and as far off the traveled portion of the roadway as possible, so as not to impede traffic or block the roadway unnecessarily.
2. Examine the accident scene and the surrounding area.
3. Treat victims.
4. Fight fires and other hazards.
5. Determine if shipment involves radioactive materials (placards, labels, shipping documents).
6. Notify local and Virginia EOC's on the extent of the accident, actions being taken, and assistance required.
7. Conduct preliminary survey for radiological contamination.



8. Move victims away from contaminated area when conditions permit. Remove contaminated clothing and attach disaster tag.
9. Keep unnecessary persons away from the area.
10. Avoid direct contact with radioactive material where possible.
11. Conduct detailed monitoring of the area.
12. Monitor all response personnel and decontaminate if necessary.
13. Monitor, decontaminate, and control all personnel, clothing, and equipment.
14. Record and report all activities to supervisors when time permits.
15. Have available and use protective clothing, if appropriate.
16. Use plastic bags to collect contaminated items. Note locations where samples originated (label bags on source and contents).
17. Do not allow eating, drinking, smoking, or other activities within contaminated areas that might lead to intake of radioactive materials.

Tab B to Appendix 15

Response Organization for Transportation Accidents



Appendix 16:  
NUCLEAR WEAPON ACCIDENT

I. REFERENCES

- A. DOD Directive 3150.8, DOD Response to Radiological Accidents.
- B. DOD Directive 5230.16, Nuclear Accident and Incident Public Affairs Guidance.
- C. DOD Directive 3025.1, Military Support to Civil Authorities.
- D. DOD Directive 3025.12, Military Assistance for Civil Disturbances.
- E. DOD Directive 3150.5, DOD Response to Improvised Nuclear Device (IND) Incident.
- F. DOD 3150.8-M, Nuclear Weapon Accident Response Procedures (NARP).
- G. Joint Federal Bureau of Investigation, Department of Energy, and Department of Defense Agreement for Response to Improvised Nuclear Device Incidents.
- H. The Atomic Energy Act of 1954, as amended.
- I. Pub. L. 97-351 "Convention on the Physical Protection of Nuclear Material Implementation Act of 1982."
- J. Department of Defense, Department of Energy, Federal Emergency Management Agency Memorandum of Agreement of Response to Nuclear Weapon Accidents and Nuclear Weapon Significant Incidents, 1983.
- K. National Response Plan, Nuclear/Radiological Incident Annex, December 2004.

II. DEFINITIONS

- A. See Appendix 18 of this plan.
- B. For additional definitions, see References B., D., and F., above.

III. MISSION

The mission of the Commonwealth of Virginia and political subdivisions is to plan for, prepare for, and coordinate and conduct response to nuclear weapons accidents or incidents reportedly involving nuclear weapons in peacetime emergencies.

#### IV. SITUATION

In a nuclear weapon accident, health and safety, public affairs, classified information security, and weapons recovery are the critical concerns facing response organizations. Other radiological aspects to be addressed include medical assistance, security, logistics, legal implications, site restoration, communications, and response forces integration and coordination. Overall coordination of these operations will be managed by VDEM in conjunction with the responsible federal agency.

In situations where a federal agency owns, authorizes, regulates, or is otherwise deemed responsible for the facility or radiological activity causing the emergency, and has authority to take action onsite, that agency will be the Coordinating Federal Agency.

The Department of Defense (DOD), U.S. Department of Energy (DOE), Nuclear Regulatory Commission (NRC), Department of Homeland Security (DHS), U.S. Coast Guard (USCG), Environmental Protection Agency (EPA), or the National Aeronautics and Space Administration (NASA), depending on which agency owns or authorizes operation, will be the Coordinating Agency for nuclear weapons accidents.

Sabotage and terrorism are treated as separate types of emergencies, and therefore are considered as a complication or added dimension to an incident involving a nuclear weapon. The coordinated response to contain or mitigate a threatened or actual release of radioactive material would be essentially the same whether it resulted from an accidental or deliberate act.

In the event of an offsite radiological accident involving a nuclear weapon, special nuclear material, and/or classified components, the owner (DOD, DOE, NRC, DHS, USCG, EPA or NASA) will declare a National Defense Area (NDA) or National Security Area (NSA), respectively and this area will become "onsite" for the purposes of this plan.

The National Defense Area and NSA's are established to safeguard classified information and/or restricted data or equipment and material. Establishment of these areas places non-federal lands under federal control and results only from an emergency event. It is possible that radioactive material would extend beyond the boundaries of these areas.

#### V. RESPONSIBILITIES AND CONCEPT OF OPERATIONS

- A. Responsibilities and concept of operations of the Commonwealth of Virginia and the local governments in response to a nuclear weapon accident are similar to the missions required for transportation accidents involving radioactive materials. Refer to Appendix 15, Transportation Accidents, in this plan.
- B. DOD is charged with the safe handling, storage, maintenance, assembly, and transportation of nuclear weapons, nuclear weapons components, and other

radioactive materials in DOD custody and with the safe operation of DOD nuclear facilities. Within DOD, the military service or agency responsible for the facility, ship, or area is responsible for the onsite response. The military service or agency having custody of the material outside an installation boundary is responsible for the onsite response.

Attachments:

Tab A - Naval Weapons Station, Yorktown, Virginia, Basic Plan.

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Tab A to Appendix 16

Naval Weapons Station, Yorktown, Virginia

1. Activities and Locations

Located in York County and operated by the U.S. Navy. This facility maintains the capability for the storage and transportation of nuclear weapons to and from the Station. The U.S. Naval Weapons Station has been tasked as the initial response force for any Naval custody weapons accidents in the Commonwealth of Virginia.

2. Population Affected

Population census for potentially affected areas York and Gloucester Counties according to the 2000 census are as follows:

York County	56,297
Gloucester County	34,780

The actual affected area as a result of an incident occurring at the NWS, Yorktown is expected to be significantly less than the total population of York and Gloucester Counties.

3. Accident Assessment

Nuclear propelled ships are operated in port at lower power levels than at sea. Therefore, the radius for emergency planning zone protective procedures in the case of a radiological emergency has been established as follows:

<u>Accident Phase</u>	<u>Critical Organ and Exposure Pathway</u>	<u>EPZ Radius</u>
Plume Exposure Pathway	Whole body (external) Thyroid (inhalation)	About 3 miles
Ingestion Pathway	Thyroid, whole body, bone marrow (ingestion)	About 15 miles

4. Off-Site Arrangement and Support

Appropriate interfaces and mutual support agreements between the U.S. Navy and shipyards, weapons stations, and political subdivisions adjacent to these facilities have been or are being developed. These agreements will include notification procedures, mutual support agreements, and points of contact and will be reflected in State, local government, shipyard, and U.S. Navy facility plans.

5. Emergency Response Personnel

The following members of the emergency response organization are key radiological accident personnel at U.S. Navy facilities at Yorktown:

U.S. Naval Weapons Station,	Command
Yorktown	Officer

6. Notification Procedures

Radiological incidents or accidents occurring aboard operational U.S. Navy nuclear-propelled ships, which require protective actions, will be reported to State and local governments by Commander, Submarine Force, U.S. Atlantic Fleet. Radiological accidents or incidents occurring at either shipyard or weapons station will be reported to State and local governments by the Radiological Control Office of the affected shipyard or weapons station. These offices will provide notification in accordance with the procedures contained in this Plan as follows:

a. Site Area Emergency, notify:

- (1) Virginia EOC.
- (2) Local government(s), if immediate protective actions are required.

b. General Emergency, notify:

- (1) Local government(s), if immediate protective actions are required.
- (2) Virginia EOC.

c. Notification of Unusual Event and Alert Classifications will be reported to the Virginia EOC.

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Appendix 17:  
NAVAL NUCLEAR PROPULSION PROGRAM  
FACILITIES AND SHIPS

I. DEFINITIONS

See Appendix 18.

II. MISSION

To provide, in one appendix, detailed information about the Naval Nuclear Propulsion Program (NNPP) facilities and ships for ready reference and appropriate response to NNPP related radiological emergencies.

III. CONCEPT OF OPERATIONS AND PROCEDURES

This plan is concerned primarily with radiological emergencies that could occur at NNPP radiological work facilities or nuclear-propelled ships located in Virginia, which might have an impact on the public health and safety of Virginia citizens. Because of differences in design and operation between naval nuclear propulsion plants and commercial nuclear power plants, the exposure to the public would be localized and not severe in the highly unlikely event of a release of radioactivity from a ship. This has been recognized in this plan by identifying an Area of Planning Attention applicable to radiological emergencies associated with NNPP ships.

IV. SITUATION

A. Naval Nuclear Propulsion Program (NNPP) radiological work facilities and ships in the Greater Hampton Roads area are potential sources of radiological emergencies. All nuclear powered vessels and their support facilities are under the radiological regulatory authority of the Naval Nuclear Propulsion Program (NNPP) – a joint program of the U.S. Navy and U.S. Department of Energy/National Nuclear Security Administration.

1. Norfolk Naval Station

Norfolk Naval Station is a 4600-acre military facility that lies within the corporate boundaries of the city of Norfolk, Virginia, specifically at Sewells' Point, and is bordered on the east by Interstate 64 (I-64) and Mason Creek, on the north by Willoughby Bay, on the west by the Elizabeth River, and on the south by the City of Norfolk. NNPP radiological work facilities located at Norfolk Naval Station and nuclear-propelled ships berthed at the piers present a potential source of a radiological emergency.



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2. Naval Nuclear-Propelled Ships

Naval nuclear ships underway in contiguous waters, to include Hampton Roads and the Chesapeake Bay, are a potential source of a radiological emergency.

3. Naval and Private Shipyards

Construction, repair/maintenance, testing, and refueling of naval nuclear ships at Norfolk Naval Shipyard and Northrop Grumman Newport News provide potential sources of a radiological emergency.

Norfolk Naval Shipyard is a 1200-acre public shipyard that lies within the corporate boundaries of the city of Portsmouth, Virginia. It is located on the Southern Branch of the Elizabeth River eight miles upstream from the confluence of the James and Elizabeth Rivers.

Northrop Grumman Newport News is an approximately 600-acre private shipyard that lies within the corporate boundaries of the city of Newport News, Virginia. It is located about two miles north of the mouth of the James River.

B. The NNPP transports radioactive material on roadways, railways, and waterways within the Commonwealth of Virginia. Norfolk Naval Shipyard and Northrop Grumman Newport News have radiological emergency response teams which will respond to NNPP radiological transportation accidents and can respond to non-NNPP radiological transportation accidents, if requested.

C. Area of Planning Attention

1. Emergency Planning Zones (EPZs) established by NUREG 0654/FEMA-REP-1 are not applicable to naval nuclear propulsion plants. Because of differences in design and operation between naval nuclear propulsion plants and commercial nuclear power plants, the exposure to the public would be localized and not severe in the highly unlikely event of release of radioactivity from a ship. Therefore, there is no need for the Cities of Portsmouth, Norfolk, Chesapeake, Newport News, and Hampton to have special emergency response plans as are required for localities where commercial nuclear power plants are located. To assist State and local authorities in assessing the need for any preplanning in the vicinity of naval bases or shipyards where nuclear powered vessels are berthed, the Naval Nuclear Propulsion Program has designated Areas of Planning Attention.

The Areas of Planning Attention extend 3-miles around every location where nuclear-powered vessels are normally berthed (i.e., from the actual dock or pier – not the shipyard or naval base property boundary). The 3-miles distance is based on detailed, conservative analysis of worst-case, but credible scenarios – the actual radius of the downwind area will most likely be smaller. For Norfolk Naval Shipyard, Norfolk Naval Station, and Northrop Grumman Newport News, only small portions of the Areas of Planning Attention cross over the Federal

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Property Boundary (see maps attached as figures 1 through 6 of Tab G to this appendix).

2. The State and local authorities are responsible for making Protective Action Decisions and implementing appropriate protective measures to protect persons within the affected jurisdictions, but outside of the Naval Nuclear Propulsion Program affected facility's boundary.

## V. ORGANIZATION AND RESPONSIBILITIES

- A. The NNPP radiological emergency response organization is based on normal naval command structures and channels of communication with the Primary Commander directing the response through the Area Commander, who coordinates the overall response. The NNPP provides support to the Primary Commander during the response. Other naval commands and support agencies provide support and assistance, on request. See Tab A.
- B. Command Responsibilities
  1. Primary Commander/Deputy Primary Commander (Unified Area Commander in accordance with the National Response Plan (NRP) and the National Incident Management System (NIMS)) – Commander, Fleet Forces Command (CFFC) is designated as the Primary Commander and Commander, Submarine Forces Atlantic (COMSUBLANT) is designated as the Deputy Primary Commander. CFFC and COMSUBLANT are responsible for controlling, directing, and coordinating all Navy activity responses to a nuclear or radiological accident that may occur within Virginia.
  2. Area Commander (Area Commander in accordance with the National Response Plan (NRP) and the National Incident Management System (NIMS)) – Area Commander is responsible for implementing and executing actions in a particular area under the cognizance of the Primary Commander.
    - a. Area Commander responsibility for ships and equipment associated with the NNPP at Norfolk Naval Shipyard and Norfolk Naval Station is assigned to the Norfolk Naval Shipyard Commanding Officer (CO).
    - b. Area Commander responsibility for ships and equipment associated with the NNPP at Northrop Grumman Newport News (NGNN) Shipyard is assigned to the Supervisor of Shipbuilding Newport News (SUPSHIP Newport News), with NGNN as its implementing agency.
    - c. Area Commander responsibility for ships underway in Hampton Roads and the Chesapeake Bay in the Commonwealth of Virginia area is assigned to COMSUBLANT. Norfolk Naval Shipyard assists COMSUBLANT in executing Area Commander duties.
    - d. Basic responsibilities of the Area Commanders are:

1. Assess the nature and extent of the emergency at their command and make appropriate emergency classifications and notifications to the State and local governments. If the emergency involves offsite in-transit NNPP radiological materials, notify the State and affected city or county.
2. Activate and staff the Emergency Control Center.
3. Develop initial Protective Action Recommendations (PARS) for the affected public at the appropriate emergency classification level. Conduct harbor and land (perimeter, off-site, and on-site) monitoring and collect off-site TLDs. (See Tabs F and G.)
4. If requested, provide representative(s) to the State EOC. Later, provide a senior representative to the Recovery and Task Force at the State EOC.
5. Control access to the affected facility.
6. Provide a Spokesperson and staff to the Joint Public Information Center (JPIC).
7. Coordinate with State and local representatives to ensure timely dissemination of accurate information to the public regarding a radiological emergency involving facilities, ships, or personnel.
8. Maintain 24-hour emergency response capability and assure availability of resources, to include communication links with the State and local governments.
9. Provide updates of the affected facility's or ship's status along with meteorological and radiological data to the State and local governments.
10. Prepare and maintain an accurate and complete record of events, decisions, and actions to document and provide review capabilities.
11. Provide field team coordination with the Commonwealth of Virginia teams in support of emergencies or off-yard transportation accidents.
12. Provide National Atmospheric Release Advisory Capability (NARAC) data-based plots to the State and local governments.
13. Develop and maintain emergency plans and procedures.
14. Maintain MOUs and MOAs with Federal, State and local response organizations.

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15. Train and exercise personnel, plans, procedures, and equipment essential for emergency response.
3. Custodial Commander or Commanding Officer of the affected ship (Incident Commander in accordance with the National Response Plan (NRP) and the National Incident Management System (NIMS))) – The Custodial Commander is responsible for initiating applicable emergency response plans and establishing communications with the Area Commander for assistance.
  4. Naval Nuclear Propulsion Program – Radiological regulatory authority for Norfolk Naval Shipyard, Norfolk Naval Station, and Supervisor of Shipbuilding, Newport News (with Northrop Grumman Newport News as implementing agency). Serves as Lead Federal Agency under the Federal Radiological Emergency Response Plan (FRERP) (or Coordinating Agency under the National Response Plan (NRP)) for radiological emergencies at Norfolk Naval Shipyard, Norfolk Naval Station, and Northrop Grumman Newport News Shipyard. Basic responsibilities are:
    - a. Function as Lead Federal Agency (LFA) in accordance with the FRERP. When issued, the Nuclear/Radiological Response Incident Annex of the National Response Plan will supercede the Federal Radiological Emergency Response Plan. The NNPP is the Coordinating Agency under the NRP and retains the same responsibilities as below.
    - b. Authorizes emergency response personnel and equipment assistance from Naval Nuclear Propulsion Program Headquarters, other naval shipyards, submarine bases, naval stations, prototypes, Bettis and Knolls Atomic Power Laboratories as required.
    - c. Request U.S. DOE Radiological Assistance Program (RAP) Teams and FRMAC assistance.
    - d. Request U.S. DOE Aerial Measuring System (AMS).
    - e. Provide Federal Radiological Emergency Response Plan coordination with other Federal agencies.
  5. See Tab A for the overall NNPP emergency response organization.
- C. Norfolk Naval Shipyard and COMSUBLANT execute Area Commander and Deputy Primary Commander functions from the Norfolk Naval Shipyard Emergency Control Center (ECC) located at Norfolk Naval Shipyard.

Supervisor of Shipbuilding, Newport News, with Northrop Grumman Newport News (NGNN) as its implementing agency, executes Area Commander functions from the NGNN ECC located at NGNN Shipyard.

The NNPP local ECCs will be activated for radiological and reactor emergencies in accordance with NNPP protocols. The local ECC provides the focal point for receipts of all on-site and off-site monitoring reports, joint State-NNPP accident assessment, and for exchange of information between the State and the NNPP.

- D. Both Norfolk Naval Shipyard and Northrop Grumman Newport News ECCs are set up to accommodate a State On-Scene Coordinator (SOSC), a Radiation Assessment Officer, Radiation Field Team Coordinator, dose assessment personnel, and other assistance.
- E. For emergencies at NNPP facilities, the Joint Field Office (JFO), Federal Response Center (FRC), Disaster Field Office (DFO) and/or Federal Radiological and Monitoring Assessment Center (FRMAC) can be established at Norfolk Naval Shipyard, Northrop Grumman Newport News Shipyard, or at a location chosen by FEMA and State/local authorities.

## VI. OPERATIONAL CONCEPTS

### A. Emergency Classification Levels

The Naval Nuclear Propulsion Program (NNPP) uses the four classes of Emergency Action Levels (EALs) specified in NUREG-0654/FEMA-REP-1. While the NNPP uses the same four classes as commercial nuclear power plants, the NNPP's methodology for establishing the EALs is different. The Nuclear Regulatory Commission (NRC) and Federal Emergency Management Agency (FEMA) guidance for establishing EALs contained in NUREG-0654/FEMA-REP-1 is primarily based on plant or site conditions (e.g., loss of offsite power, loss of one or more fission product barriers). Because of the differences in the design and operation of NNPP nuclear propulsion plants, the NRC/FEMA guidance is not applicable to NNPP nuclear propulsion plants.

The NNPP EALs are normally classified based on a conservative estimate of total radiation exposure to a hypothetical member of the public located near the Federal Government property boundary (or nearest public residence) in terms of dose to the whole body (i.e., Total Effective Dose Equivalent (TEDE)) or dose to the thyroid (Committed Dose Equivalent (CDE)) during the plume phase. The NNPP used the Protective Action Guides (PAGs) specified by the Environmental Protection Agency (EPA), in EPA 400-R-92-001 of October 1991, to establish the General Emergency threshold doses (1 Rem TEDE, 5 Rem CDE thyroid). The dose thresholds for the lower tier event classes (Site Emergency, Alert, and Unusual Event) were then established using fractions of the EPA PAGs.

Event Classification*	Radiation Dose*	Radioiodine Dose*
Unusual Event	<0.01 Rem	<0.05 Rem
Alert	≥0.01 to <0.1 Rem	≥0.05 to <0.5 Rem
Site Emergency	≥0.1 to <1.0 Rem	≥0.5 to <5.0 Rem
General Emergency	≥1.0 Rem	≥5.0 Rem

\*Normally based on exposure levels of a hypothetical person located at the Federal Government property boundary or the nearest public residence.

The dose estimates are made using actual field survey data taken near the Federal facility property boundary and a two-hour release is assumed if the duration of the release is unknown. Since field survey data will not be immediately available, the NNPP will normally assign an event classification of "Alert" if an event involves actual or potential for reactor core damage and there is an actual or potential for a release of radioactivity to the environment. The "Alert" level is considered an appropriate balancing of concerns because fission product release implies a level of serious above an Unusual event, and higher levels (Site or General Emergency), involve, as a minimum, warnings to the general public that might not be appropriate.

An initial event classification of "Unusual Event" will be normally assigned if a reactor core is not involved (e.g., facility fire involving radioactive materials), and a release of radioactivity to the environment has occurred with potential for measurable dose to a hypothetical member of the public near the Federal facility property boundary. Classification levels do not apply to small inadvertent discharges, such as valve leakage or process piping joint leakage, involving small volume of liquid into a large body of water. Other Naval reporting processes will report these small inadvertent discharges. (See Tab F.)

1. Class: UNUSUAL EVENT

Description: Unusual events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response are expected unless further degradation of safety systems occurs. If minor releases of radioactivity off-site do occur, releases are expected to result in whole body radiation exposures of  $<0.01$  Rem or thyroid exposures of  $<0.05$  Rem at the Federal Government property boundary (or nearest public residence).

2. Class: ALERT

Description: Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the EPA PAG exposure levels near the Federal Government property boundary (or nearest public residence). Radioactivity releases are expected to result in whole body radiation exposures of  $\geq 0.01$  to  $<0.10$  Rem or thyroid exposures of  $\geq 0.05$  to  $<0.50$  Rem at the Federal Government property boundary (or nearest public residence).

3. Class: SITE EMERGENCY

Description: Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to exceed EPA PAG exposure levels beyond the

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Federal Government property boundary. Releases are expected to result in whole body radiation exposures of  $\geq 0.1$  to  $< 1.0$  Rem or thyroid exposures of  $\geq 0.5$  to  $< 5$  Rem at the Federal Government property boundary.

4. Class: GENERAL EMERGENCY

Description: Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be expected to exceed EPA PAG exposure levels near the Federal Government property boundary. Releases are expected to result in whole body radiation exposures  $\geq 1.0$  Rem or thyroid exposures of  $\geq 5.0$  Rem at the Federal Government property boundary.

5. Recovery, Relocation, and Re-entry

The Recovery, Relocation and Reentry Phase will begin when the NNPP Emergency Control Center (ECC) terminates the Alert, Site Emergency or General Emergency Phase or when events at the site have been down-graded and conditions stabilized. Off-site radiological monitoring, assessment, and environmental sampling will be continued until terminated by the State Radiological Assessment Officer, VDH officials, and the State Coordinator or when missions have been completed. State and local government officials will continue to take whatever actions necessary to provide for the safety and economic well being of the population and to return impacted areas to normalcy.

B. Accident Assessment

The Area Commander will perform initial accident assessment as soon as possible after identification of the problem. Results of the assessment, emergency classification level, along with recommended protective actions will be transmitted without delay to the Virginia EOC. If immediate protective actions are required, local governments will be notified on a priority basis. The Bureau of Radiological Health, State Department of Health (BRH) will perform independent follow-on monitoring and assessment. BRH will continue to independently monitor and evaluate the off-site radiological situation to the extent possible until such activities are no longer required. Tab F provides the NNPP methodology for radiological emergency accident assessment.

C. Notification and Warning

1. Area Commanders of NNPP facilities use a two-tiered approach for accident notification. The Area Commander will immediately notify the Virginia Emergency Operations Center (Virginia EOC) via a “*Heads-Up*” phone call whenever any of the four classes of radiological emergencies occur. The “*Heads-Up*” phone call is executed within 10 minutes of manning the Emergency Control Center (ECC) on-site, followed by “*Heads-Up*” phone calls to the Virginia Department of Emergency Management, Bureau of Radiological Health,

and local governments. Formal notification is accomplished via written reporting format - see Tab B for the reporting format.

2. The primary means of notification will be by commercial telephone and facsimile machine.
3. The initial notification from the facility of an Unusual Event, Alert, Site Emergency, or General Emergency will be verified by local jurisdictions and the Virginia EOC. Subsequent transmissions of information need not be verified unless the source is suspect. The facility Emergency Communicator will provide verification telephone numbers to the Virginia EOC Communications Center and to local government communications centers.
4. Emergency Response Personnel

The following individuals are members of the emergency response organization or are key radiological emergency personnel at NNPP facilities and shipyards:

<b>Activity</b>	<b>Title</b>	<b>Telephone Number</b>
Commander, Submarine Force, U.S. Atlantic Fleet, Norfolk (COMSUBLANT)	Director, Radiological Emergency Planning	Duty Hours: 757-836-1296
	COMSUBLANT Watch Officer	Non-Duty Hours: 757-836-1000
Norfolk Naval Shipyard, Portsmouth	Director, Radiological Controls Office	Duty Hours: 757-396-5885
	Emergency Control Center	Duty Hours: 757-396-4950
	Shipyard Duty Officer	Non-Duty Hours: 757-396-8615/8616
	Director, Radiological Emergency Planning	Duty Hours: 757-396-4524
Northrop Grumman Newport News	Director, Radiological Control Department	Duty Hours: 757-380-2616
	Emergency Control Center	757-380-2305
	Communications Center	Non-Duty Hours: 757-380-2223
	Director, Radiological Emergency Planning	Duty Hours: 757-380-3123

5. The Virginia EOC will notify the State Bureau of Radiological Health (BRH) and the State Coordinator of Emergency Management who will in turn notify the Governor's Office.
6. The Virginia EOC will notify BRH and other State agencies with radiological emergency response tasks. Information will also be relayed on ECL, meteorological conditions, radiological releases and plant status.



7. State agencies and local governments will alert emergency personnel to standby status and implement increased readiness procedures to assure that immediate response actions may be taken, if required.
8. The Area Commander will use the Report of Radiological Conditions form at Tab C to transmit technical information to the Virginia EOC by fax.
9. Primary responsibility for alerting the general public of response actions lies with VDEM in coordination with the affected local governments. In the event the State cannot be reached for any reason, local governments may alert the public and inform the State EOC afterward. Because of differences in design and operation between naval nuclear propulsion plants and commercial nuclear power plants, the exposure to the public would be localized and not severe in the highly unlikely event of a release of radioactivity from a ship. Therefore, NNPP facilities do not have siren-alerting systems. Combinations of readily available alerting methods used for natural and other hazardous materials disasters should be utilized as the primary method for alerting the public.

#### D. Implementation of Protective Actions

1. Protective actions within the affected Federal Government facility site boundary will be the responsibility of the Area Commander.
2. The Area Commander will make recommendations to the Virginia EOC regarding appropriate off-site protective actions, based on radiological measurements and dose assessments. The decision to implement these actions is up to the State and local governments. The implementation of any protective actions beyond the site boundary is the primary responsibility of the local governments. Follow-up actions will be taken on the advice of the Virginia EOC based on results of evaluation and assessment of the accident.
3. Tab D contains the form used by the Virginia EOC to inform local governments of protective actions for NNPP events. If the Virginia EOC cannot be reached by telephone immediately, local Director(s) of Emergency Services, on the basis of the protective action recommended by the Area Commander, will warn the public and advise the public of immediate protective actions to be taken.
4. Affected Population within Area of Planning Attention

The Areas of Planning Attention extend 3-miles around every location where nuclear-powered vessels are normally berthed (i.e., from the actual dock or pier – not the shipyard or naval base property boundary). For Norfolk Naval Shipyard, Norfolk Naval Station, and Northrop Grumman Newport News, only small portions of the Areas of Planning Attention cross over the Federal Property Boundary (see maps attached as figures 1 through 6 of Tab G).

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E. Medical Response

The Area Commander is responsible for taking appropriate actions for injured personnel on-site. Because the hazard associated with the involved radioactivity is well below life-threatening levels, medical treatment takes precedence over radiological controls for injured personnel who are radioactively contaminated. The Area Commander maintains agreements with off-site medical facilities for medical treatment of radioactively contaminated and injured personnel. NNPP sites provide health physics and radiological monitoring support to these medical facilities. See Tab H.

F. Public Affairs

1. The affected Area Commander is responsible for assigning a Public Affairs Officer (PAO) to prepare, staff, and release press statements for NNPP radiological and reactor accidents. Press statements will be shared with the Virginia EOC prior to release.
2. A NNPP PAO will be assigned as liaison at the Joint Public Information Center (JPIC). If requested, Norfolk Naval Shipyard and Northrop Grumman Newport News can provide a facility for the information center near the affected site.
3. News conferences will involve a NNPP spokesperson and will be conducted in concert with the State and local governments.

G. Transportation Accident Response

Local emergency and law enforcement personnel have the primary responsibility for response and immediate actions for transportation accidents, including accidents involving radioactive materials.

NNPP transportation consignments are categorized as general shipments (non-escorted carrier), or naval nuclear fuel rail shipments (new and spent fuel) escorted by the Department of Energy (DOE) Pittsburgh Naval Reactors (PNR) courier personnel. In the event of a transportation accident involving NNPP radioactive materials, Norfolk Naval Shipyard and Northrop Grumman Newport News have the personnel, supplies and equipment available for Transportation Emergency Response Teams (TERTs). In addition to the local shipyards, Federal Escorts respond to transportation accidents involving nuclear fuel.

When the NNPP is the responsible party, the primary responsibilities of NNPP program emergency personnel when responding to NNPP transportation accidents are to ensure public safety and minimize damage to government property. NNPP response personnel will provide radiological monitoring support, radiological controls advice concerning recovery actions, and provide information concerning potential hazards from radioactive materials.

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If requested, the NNPP may authorize Norfolk Naval Shipyard or Northrop Grumman Newport News to provide assistance to a non-NNPP transportation accident involving radioactive materials.

H. Recovery and Re-entry

Recovery actions are contained in Tab E.

VII. PROCEDURES

A. Emergency Control Center Operation

1. The affected Area Commander's ECC will be activated as soon as practicable for radiological and reactor accidents involving NNPP facilities and ships. The ECC provides a central location for collection and assessment of reactor plant and radiological information/data, mobilization of personnel and resources, notification of off-site organizations and commands, exchange of information with State and Local governments, and overall management of the emergency.
2. The NNPP ECC will also be activated, if deemed appropriate. The ECC provides a focal point for communications with higher level authorities and commands, and oversight of accident assessment and mitigation.
3. Accommodations are available in the Area Commander ECC's to support State liaison personnel.

B. Emergency Response

1. Emergency Response Procedures

- a. Specific actions to be taken by the Area Commander and the State for each of the four emergency classification levels and the Recovery, Relocation and Re-entry Phase are listed in chart form at Tab E.

C. Communication Equipment

1. Telephone System. Telephones constitute the primary means of communications between the Area Commander ECC and support organizations, outside agencies, and other commands. Telephones installed aboard ships are also the primary method for communicating with in-hull personnel. Primary means of communicating between the ECC and Virginia and local government EOC's is via commercial telephone on a teleconferencing bridge.
2. Radio Communication System. Radios constitute the primary means of communication between the ECC, the Field Control Group and other field personnel. Radios also provide a backup system for communicating with

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numerous support organizations, outside agencies, and other commands should the telephone system fail.

3. Paging System. The group paging system is used as the basic notification method for Area Commanders.
4. Facsimile Transmitting Equipment. A facsimile transceiver is located in the ECC for transmitting and receiving information such as press releases, technical data, sketches, drawings, etc., to or from off-base organizations. Additional facsimile transmitting equipment is available in the shipyard.
5. Email. Email is used to transfer information electronically.
6. DOE Equipment. Additional communication resources to support response at the accident location can be made available through the DOE's Nuclear Emergency Search Team within 24 hours after an emergency. These resources will be available for the overall response and would, therefore, be supplementing state and local response and other federal agency response as well as the shipyard's response.

D. Off-site Transportation Accident

1. Area Commanders may be requested to respond to an accident on public highways involving radioactive material under U. S. Navy cognizance. For example, a transportation accident involving a radioactive shipment between Naval Station, Norfolk and Norfolk Naval Shipyard. The Area Commander can be notified of an accident by three sources:
  - a. A commercial driver or Radioactive Material Controller (for government shipments) may call the NNPP facility emergency response number per the emergency response plan that is part of the shipping papers for the material.
  - b. State or local authorities responding to an accident may call the NNPP facility emergency response number after finding the emergency response plan with the shipping papers or observing the NNPP facility markings on the packages and radioactive material placards on the vehicle.
  - c. Naval Reactors may call due to the proximity of an accident to an Area Commander and request the Area Commander to respond.
  - d. If requested, the NNPP may authorize Norfolk Naval Shipyard or Northrop Grumman Newport News to provide assistance to a non-NNPP transportation accident involving radioactive materials.
2. State or local authorities on scene will be in charge and requests to post boundaries, move onlookers, detain and survey people in the area, perform cleanup, etc., must be coordinated through them.

3. For any spilled radioactive material, the NNPP may assist with the cleanup of the accident site. The cleanup will include repackaging any radioactive material for transportation and decontaminating the accident site to levels acceptable for unrestricted general public use as determined by State and local officials.
4. The NNPP transports radioactive material on roadways, railways, and waterways within the Commonwealth of Virginia. Norfolk Naval Shipyard and Northrop Grumman Newport News have radiological emergency response teams which will respond to NNPP radiological transportation accidents and can respond to non-NNPP radiological transportation accidents, if requested.

#### 5. NAVAL SPENT FUEL SHIPMENTS

Shipments of naval spent fuel periodically travel by rail through Virginia. The shipments originate at either Norfolk Naval Shipyard or Northrop Grumman Newport News Shipyard. The shipments are destined for the Idaho National Engineering and Environmental Laboratory near Idaho Falls, Idaho. These shipments move on Department of Defense (DODX) railcars and that are accompanied by Federal Security Officers who are trained in accident assessment and response.

Naval spent fuel transportation casks are Type B radioactive material packages designed, tested/analyzed, manufactured and used in accordance with Nuclear Regulatory Commission requirements. Type B packages are formidable, robust containers designed to retain the radioactive cargo and minimize radiation levels on or near the outside of the containers, even after severe accident conditions.

Outside radiation levels on the surface of a naval spent fuel-shipping container are well below the Department of Transportation allowable limit of 200 millirem per hour. At a distance from these shipping containers, radiation levels are not distinguishable from radiation resulting from natural radioactivity.

Naval spent fuel shipments are "dry", with only a minimal amount of moisture remaining in the container in the ready-for-transport condition after loading operations.

Due to the formidable nature of the container, and the fact that the spent fuel itself is highly rugged, nonflammable, nonexplosive and made of hard to disperse material, the emergency response actions in the event of an accident/derailment are:

- Emergency first-aid/life-saving actions (without regard to radiation/radioactivity) – Since radiation presents minimal risk to transport workers, emergency response personnel, and the public during transportation accidents, medical problems take priority over radiological concerns.
- Get expert help to the scene

- Prevent further injury or damage
- And last, radiological controls – Normal personnel protective equipment used by firefighters and emergency medical personnel will provide adequate control in the unlikely event of radiological contamination during the earlier phases.

The Federal escorts will work closely with and support any Incident Commander in accident assessment and response if there are no security-threatening conditions related to the accident/event. The Federal escorts have the training and equipment to perform radiological surveys.

The Naval Nuclear Propulsion Program emergency operations organization for these shipments is the Pittsburgh Naval Reactors Office/Bettis Atomic Power Laboratory in Pittsburgh, Pennsylvania. The 24/7 emergency contact number for Bettis is 412-476-5000 to report a "railroad transportation emergency".

Effective accident recovery and response will require a coordinated effort of the responsible Virginia State/local emergency response organizations, the handling railroad and the shipper (Naval Nuclear Propulsion Program).

## VIII. EXECUTION

### A. Plan Maintenance and Training

1. Area Commanders and ship Commanding Officers are responsible for the technical content and maintenance of NNPP emergency response plans.
2. Area Commanders are responsible for periodic training and drills as specified in U.S. Navy directives. It is desirable to conduct joint drills and training exercises with State and local emergency management organizations. The following training plan is to be used as a guide to determine minimum number, type, and periodicity for drills and exercises.
  - a. NNPP Drills
    1. Communications Drills: Periodic communications tests will be conducted with VDEM, City of Portsmouth, City of Chesapeake, City of Newport News, City of Hampton, and City of Norfolk EOC's.
    2. Protective Action Decision-Making Drills: Tabletop drill covering the use of State and local notification forms and protocols, event classification, and protective action recommendations (including distribution of KI).
  - b. NNPP Exercises – Norfolk Naval Shipyard and Northrop-Grumman Newport News will conduct periodic exercises with State and local

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agencies. These exercises may be located at or near Norfolk Naval Shipyard, Norfolk Naval Station, or Northrop-Grumman Newport News.

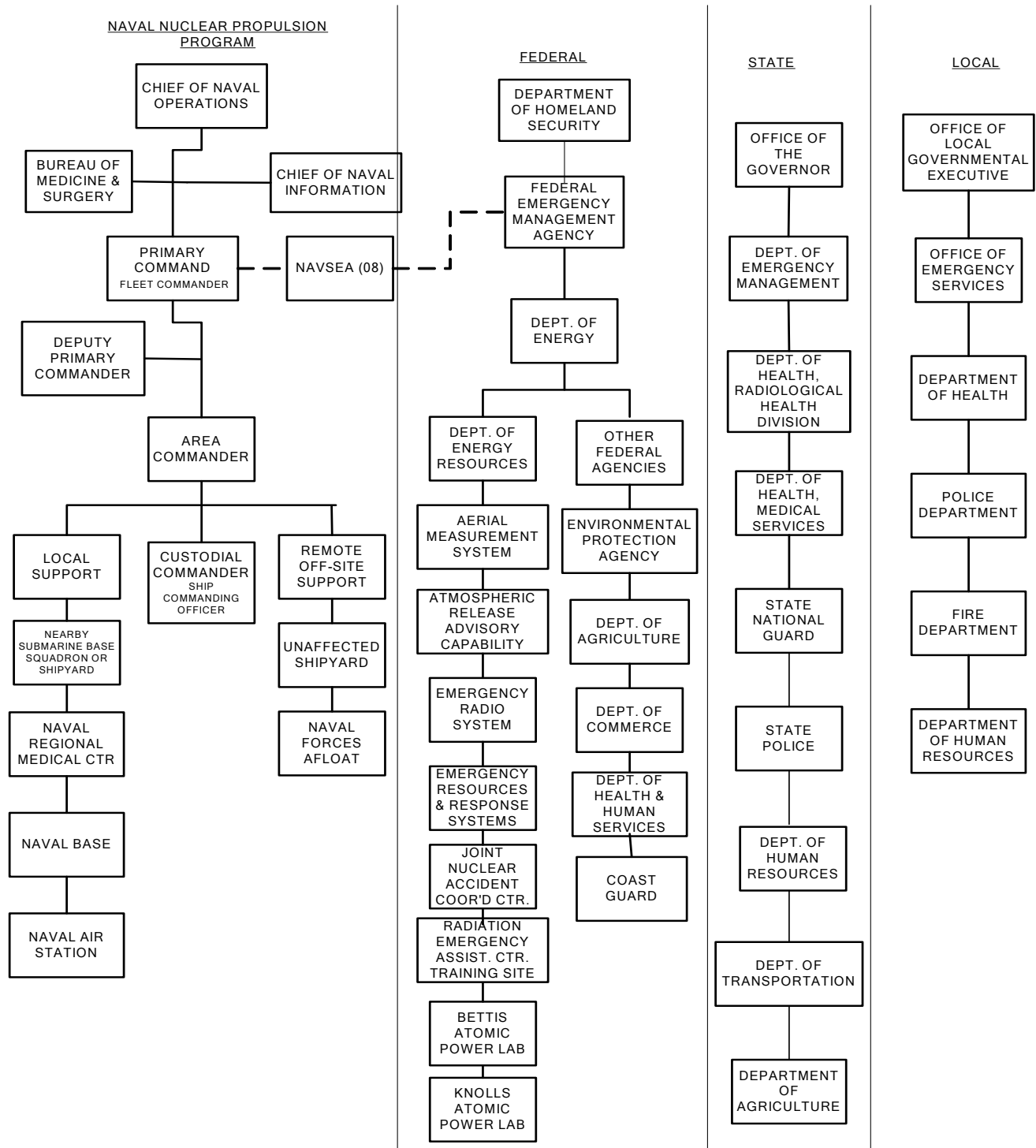
- c. Critiques or “hot scrubs” will be conducted after the drill or exercise to identify areas of improvements. Exercise and drill comments are to be evaluated for possible modifications to plans and procedures.

TABS:

Tab A	Overall NNPP Emergency Response Organization
Tab B	Report of Emergency For Use By Commonwealth of Virginia
Tab C	Report of Radiological Conditions
Tab D	Protective Actions
Tab E	Emergency Response Procedures
Tab F	Accident Assessment
Tab G	Areas of Planning Attention
Tab H	Medical Services

Tab A to Appendix 17

Overall NNPP Emergency Response Organization





Tab B to Appendix 17

**Message No.:** \_\_\_\_\_  
**(For State Use Only)**

**Report of Emergency -  
For Use By Commonwealth of Virginia**

**Message:**

“This is  Norfolk Naval Shipyard  Northrop Grumman Newport News Shipbuilding Emergency Control Center.  
The emergency message is as follows:”

**Item 1. Emergency class:**

Declared at \_\_\_\_\_ on \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
(24 Hr. time) (Date)

- Unusual Event
- Alert
- Site Emergency
- General Emergency
- Emergency terminated

**Item 2. Release of radioactive material:**

- Has **not** occurred and is **not** projected.
- Has occurred and is now terminated.
- Is presently occurring.
- Is projected to occur.

**Item 3. Remarks/Description of Event:** \_\_\_\_\_

**Note:** Items 4 through 8 may be excluded from the initial message reporting of an emergency class and termination reports.

**Item 4. Assistance Requested:**

- None.
- \_\_\_\_\_ (number) Fire Units from \_\_\_\_\_
- \_\_\_\_\_ (number) Police Units from \_\_\_\_\_
- \_\_\_\_\_ (number) Rescue Units from \_\_\_\_\_
- \_\_\_\_\_ (Other) \_\_\_\_\_
- Not Required

**Item 5. Emergency response actions underway:**

- None.
- \_\_\_\_\_ Station emergency personnel called in.
- \_\_\_\_\_ Station monitoring teams dispatched offsite.
- \_\_\_\_\_ (Other) \_\_\_\_\_
- Not Required

**Item 6. Evacuation of on-site personnel:**

- No.
- Yes, Evacuated to \_\_\_\_\_
- Not Required

**Item 7. Prognosis of situation:**

- Improving.
- Stable.
- Worsening.
- (Other) \_\_\_\_\_
- Not Required

**Item 8. Meteorological data is::**

- Based on onsite measurements;
- Based on off-site regional data
- Not available.
- Wind direction is from the \_\_\_\_\_
- Wind speed is \_\_\_\_\_ MPH
- Not required.

**Item 9. This is** \_\_\_\_\_ / \_\_\_\_\_ / Emergency Communicator.  
(name) (telephone no.)

“Please acknowledge receipt of this message.”

“This is  Norfolk Naval Shipyard  Northrop Grumman Newport News Shipbuilding Emergency Control Center  
out at time \_\_\_\_\_ on \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_”  
(24 hr. time) (date)

**ITEMS 10-12 ARE CONTINUED ON THE REVERSE SIDE**

**REPORT OF EMERGENCY (Continued)**

**NOTE: THE FOLLOWING INFORMATION IS FOR STATE USE ONLY ... DO NOT TRANSMIT TO LOCAL GOVERNMENTS**

**Item 10. Recommended offsite protective actions are:**

None.

Evacuate

- None
- 360 deg from 0 miles to \_\_\_\_\_ miles
- Downwind sectors from \_\_\_\_\_ miles to \_\_\_\_\_ miles

Shelter

- 360 deg from 0 miles to \_\_\_\_\_ miles
- Downwind sectors from \_\_\_\_\_ miles to \_\_\_\_\_ miles
- Unaffected sectors from \_\_\_\_\_ miles to \_\_\_\_\_ miles

- Item 11. We:**  Will transmit a Report of Radiological Conditions to the State EOC.
- Will provide a Report of Radiological Conditions to the State representative in the  
 Norfolk Naval Shipyard  Northrop Grumman Newport News Shipbuilding  
Emergency Control Center
- Will NOT issue a Report of Radiological Conditions.

**Item 12- Update Schedule**  **60 Minutes**  **Other** \_\_\_\_\_

“This is  Norfolk Naval Shipyard  Northrop Grumman Newport News Shipbuilding Emergency Control Center  
out at time \_\_\_\_\_ on \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_”  
(24 hr. time) (date)

Message Received By: \_\_\_\_\_ Forwarded To: \_\_\_\_\_

\_\_\_\_\_

Tab C to Appendix 17

Message No.: \_\_\_\_\_  
 For Station Use Only)

**Report of Radiological Conditions-  
 For Use By Commonwealth of Virginia**

**NOTE: INFORMATION ON THIS FORM IS FOR STATE USE ONLY.**

**Message:**

“This is  Norfolk Naval Shipyard  Northrop Grumman Newport News Shipbuilding  
 Emergency Control Center. I have a report of radiological conditions.”

1. Type of release  Airborne, released at elevation of \_\_\_\_\_ ft.  
 Waterborne.  
 Surface Spill.
  - 1a. Physical form of release is  Gas;  Liquid;  Solid;  Unknown.
  - 1b. Chemical form of release is  Inert noble gas;  Radioiodines;  Unknown.  
 Specifically: \_\_\_\_\_
2. Release  began at \_\_\_\_\_;  is estimated to begin at \_\_\_\_\_  
 (24 hr. time) (24 hr. time)
3. Release duration  was \_\_\_\_\_ hours;  is estimated to be \_\_\_\_\_ hours.
4. Time between reactor shutdown and beginning of release  was \_\_\_\_\_ hours;  not applicable.
5. Wind direction is from \_\_\_\_\_; Wind speed is \_\_\_\_\_ MPH. Stability class is \_\_\_\_\_. Time of met. conditions \_\_\_\_\_  
 (24 hr. time)
6. Temperature is \_\_\_\_\_ °F. Precipitation form is  None;  Rain;  Sleet;  Snow;  (Other) \_\_\_\_\_
7. The gross release rate is :  \_\_\_\_\_ Ci/sec Noble Gas;  
 \_\_\_\_\_ Ci/sec Iodines;  
 \_\_\_\_\_ Ci/sec Particulates;  
 Unknown \_\_\_\_\_
8. Actual Deep Dose Equivalent (DDE) field measurement at Site Boundary is:  
 \_\_\_\_\_ R/hr;  Unknown.
9. Projections based on:  sample taken at \_\_\_\_\_ (24 hr. time) are:  Unknown  
 monitor reading at \_\_\_\_\_ (24 hr. time)  as follows

		Site Boundary	2 Miles	5 Miles	10 Miles
<b>PAG Dose</b>	TEDE 4 day, Rem	Rem	Rem	Rem	Rem
	Thy CDE, Rem	Rem	Rem	Rem	Rem
<b>Dose Rate</b>	TEDE, Rem/hr	Rem/hr	Rem/hr	Rem/hr	Rem/hr
	Thy CDE, Rem/hr	Rem/hr	Rem/hr	Rem/hr	Rem/hr
	DDE, Rem/hr	Rem/hr	Rem/hr	Rem/hr	Rem/hr
<b>Ratio</b>	TEDE/DDE				

10 Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

This is \_\_\_\_\_ / \_\_\_\_\_ / Emergency Communicator  
 (name) (telephone no.)

“This is  Norfolk Naval Shipyard  Northrop Grumman Newport News Shipbuilding Emergency Control Center out at  
 time \_\_\_\_\_ on \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_”  
 (24 hr. time) (date)

Message Received By: \_\_\_\_\_ Forwarded To: \_\_\_\_\_

Tab D to Appendix 17



DELIVER BY  INSTAPHONE  TELEPHONE  VCIN  FAX  OTHER

READ BOLD TYPE ● READ BOLD TYPE ● READ BOLD TYPE:

**“THIS IS  VIRGINIA EMERGENCY OPERATIONS CENTER  OTHER LOCATION:  
THIS IS A REPORT OF PROTECTIVE ACTIONS. “STAND BY FOR A ROLL CALL FOLLOWED BY AN EMERGENCY  
MESSAGE.”  CHECK THIS BOX WHEN VERIFIED BY ROLL CALL**

NNSY:  PORTSMOUTH  CHESAPEAKE  VIRGINIA BEACH  NORFOLK  
NGNN:  HAMPTON  NEWPORT NEWS

“THE EMERGENCY MESSAGE IS AS FOLLOWS:

ITEM 1. **“THE GOVERNOR DETERMINED AT \_\_\_\_\_ ON \_\_\_\_ / \_\_\_\_ / \_\_\_\_ THAT PROTECTIVE ACTIONS OR  
(24 hr. time) (date)**  
**ADDITIONAL PROTECTIVE MEASURES ARE NECESSARY FOR CERTAIN AREAS AROUND:**

NORFOLK NAVAL SHIPYARD  NORFOLK NAVAL STATION  NORTHROP GRUMMAN NEWPORT NEWS

ITEM 2. **A STATE OF EMERGENCY WAS DECLARED BY THE GOVERNOR AT \_\_\_\_\_ ON \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
(24 hr. time) (date)**

ITEM 3. Deleted

ITEM 4. **IMPLEMENT PRIMARY ROUTE ALERTING IMMEDIATELY!**  
 YES  NO

ITEM 5. **EVACUATE  YES  NO. GO TO ITEM 9.**

ITEM 6. **LOCAL GOVERNMENTS AFFECTED:**

ITEM 7. **AREAS TO BE EVACUATED:** \_\_\_\_\_

ITEM 8. **EVACUATION ASSEMBLY CENTERS:** (coordinate with Local Governments)

ITEM 9. **SHELTER (IN PLACE)  YES  NO**

ITEM 10. **LOCAL GOVERNMENTS AFFECTED:**

ITEM 11. **AREAS TO BE SHELTERED:**

**ITEMS WILL BE REPEATED IF NECESSARY**

**“THIS IS  VIRGINIA EMERGENCY OPERATIONS CENTER  OTHER LOCATION:  
OUT AT**

(date and 24 hr. time)

PLEASE ENSURE THAT THIS MESSAGE IS PASSED TO YOUR COORDINATOR OF EMERGENCY SERVICES AS SOON AS RECEIVED.

MESSAGE RECEIVED BY: \_\_\_\_\_ TITLE/POSITION: \_\_\_\_\_ TIME: \_\_\_\_\_  
(24 hr. time)

TIME MESSAGE PASSED TO LOCAL COORDINATOR (OR REPRESENTATIVE)

MESSAGE AUTHORIZED BY: \_\_\_\_\_ AT \_\_\_\_\_ ON \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
(24 hr. time) (date)

Tab E to Appendix 17

EMERGENCY RESPONSE PROCEDURES

<u>Emergency Classification Level</u>	<u>NNPP Actions</u>	<u>State Actions</u>
<b>A. Unusual Event</b>		
<b>1. Class Description</b>	<b><u>Area Commander</u></b>	<b><u>Virginia EOC</u></b>
<p>Unusual events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring off-site response or monitoring are expected unless further degradation of safety systems occurs.</p> <p>If minor releases of radioactivity off-site do occur, releases are expected to result in whole body radiation exposures of &lt;0.01 Rem or thyroid exposures of &lt;0.05 Rem at the Federal Government property boundary (or nearest public residence).</p>	<ol style="list-style-type: none"> <li>1. Activate the ECC.</li> <li>2. Immediately, notify State and Local Authorities and provide current information on the event.</li> <li>3. Confirm that no specific action by civil authorities or the public is required.</li> <li>4. Dispatch facility off-site monitoring personnel if appropriate.</li> <li>5. Activate the News Center if appropriate.</li> </ol>	<ol style="list-style-type: none"> <li>1. Coordinate State assistance, if requested.</li> <li>2. Virginia EOC notify State Coordinator.</li> <li>3. Virginia EOC notify local jurisdictions as required.</li> <li>4. Notify BRH.</li> <li>5. Stand by until verbal closeout.</li> <li>6. Escalate to a more severe class.</li> </ol>
<b>2. Purpose</b>		
<ol style="list-style-type: none"> <li>a. Assure that the first step in any response later found to be necessary has been carried out.</li> <li>b. Bring in operating staff to a state of readiness.</li> <li>c. Provide systematic handling of unusual events, information and decisionmaking.</li> </ol>		

<u>Emergency Classification Level</u>	<u>NNPP Actions</u>	<u>State Actions</u>
<b>B. Alert</b>		
<b>1. Class Description</b>	<b><u>Area Commander</u></b>	<b><u>Virginia EOC</u></b>
<p>Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.</p> <p>Any releases are expected to be limited to small fractions of the EPA PAG exposure levels near the Federal Government property boundary (or nearest public residence). Radioactivity releases are expected to result in whole body radiation exposures of <math>\geq 0.01</math> to <math>&lt; 0.10</math> Rem or thyroid exposures of <math>\geq 0.05</math> to <math>&lt; 0.50</math> Rem at the Federal Government property boundary (or nearest public residence).</p>	<ol style="list-style-type: none"> <li>1. Activate the ECC.</li> <li>2. Immediately, notify State and Local Authorities and provide current information on the event.</li> <li>3. Confirm that no specific protective actions are required at this time for the public.</li> <li>4. Dispatch facility off-site monitoring personnel if appropriate.</li> <li>5. Activate the News Center.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take actions as indicated A.1. through A.5. above.</li> <li>2. Activate Virginia EOC for emergency operations at reduced staffing.</li> <li>3. Dispatch Regional Coordinator to local government EOC.</li> <li>4. Notify Bureau of Radiological Health of the Emergency Classification Level.</li> <li>5. Dispatch VDEM Operations Officer to NNPP Area Commander ECC.</li> <li>6. Dispatch PAO to the JPIC.</li> <li>7. Alert other State agencies assigned radiological emergency response tasks.</li> <li>8. Notify local governments as required.</li> </ol>
<b>2. Purpose</b>	<b><u>NPPP</u></b>	
<ol style="list-style-type: none"> <li>a. Assure that emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring, if required.</li> <li>b. Provide off-site authorities current status information.</li> </ol>	<ol style="list-style-type: none"> <li>6. Provide Federal Radiological Emergency Response Plan (FRERP) coordination (or Nuclear/Radiological Response Incident Annex of the National Response Plan (NRP) when issued) with other Federal agencies. Function as the lead Federal Agency in accordance with the FRERP (or Coordinating Federal Agency under NRP).</li> <li>7. Request U.S. DOE Radiological Assistance Program (RAP) Teams and FRMAC assistance if required.</li> <li>8. Request U.S. DOE Aerial Measuring System (AMS) if required.</li> </ol>	<ol style="list-style-type: none"> <li>9. Alert FEMA, Region III. Relay information on ECL, meteorological conditions, radiological releases, ship's reactor status and population impact.</li> </ol> <p><b><u>Bureau of Radiological Health</u></b></p> <ol style="list-style-type: none"> <li>10. Dispatch Radiological Assessment Officer to NNPP Area Commander ECC.</li> <li>11. Be prepared to provide confirmatory off-site radiation monitoring and sampling.</li> </ol>

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Emergency Classification Level

NNPP Actions

State Actions

12. Alert DOE RCO, Region II, Oak Ridge Operations Office. Relay information on ECL, meteorological conditions, radiological releases, ship's reactor status and population impact.

Other State Agencies

12. Alert key personnel to standby status.
13. Maintain alert status until verbal close out.
14. Escalate to a more severe class.

<u>Emergency Classification Level</u>	<u>NNPP Actions</u>	<u>State Actions</u>
<b>C. Site Emergency</b>		
<b>1. Class Description</b>	<b><u>Area Commander</u></b>	<b><u>Virginia EOC</u></b>
<p>Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public.</p> <p>Any releases are not expected to exceed EPA PAG exposure levels beyond the Federal Government property boundary.</p> <p>Releases are expected to result in whole body radiation exposures of <math>\geq 0.1</math> to <math>&lt; 1.0</math> Rem or thyroid exposures of <math>\geq 0.5</math> to <math>&lt; 5.0</math> Rem at the Federal Government property boundary.</p>	<ol style="list-style-type: none"> <li>1. Activate the ECC.</li> <li>2. Immediately, notify State and Local Authorities and provide current information on the event.</li> <li>3. Confirm that no specific protective actions are required at this time for the public.</li> <li>4. Dispatch facility off-site monitoring personnel.</li> <li>5. Activate the News Center Provide Press Briefings at the News Center in coordination with the State.</li> <li>6. Recommend steps to be taken to control access and warn the general public.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take actions as indicated in B.1. through B.9, previous for an "Alert".</li> <li>2. Augment Virginia EOC staffing for 24-hour operations.</li> <li>3. Coordinate State agency on-site assistance, if requested.</li> <li>4. Be prepared to implement notification systems and any protective actions.</li> <li>5. Keep local government informed of the radiological situation and any protective action decisions.</li> <li>6. The State may elect to implement precautionary sheltering. The purpose of this precautionary sheltering is to keep the public close at hand in case immediate actions become necessary.</li> </ol>
<b>2. Purpose</b>		
<ol style="list-style-type: none"> <li>a. Assure that response centers are manned.</li> <li>b. Assure that monitoring teams are dispatched.</li> <li>c. Assure that personnel required for evacuation of near-site areas are at duty stations if situation becomes more serious.</li> <li>d. Provide consultation with off-site authorities.</li> <li>e. Provide updates for the public through off-site authorities.</li> </ol>	<ol style="list-style-type: none"> <li>7. Recommend preparatory steps to be taken for directing the general public in specific areas to evacuate or take shelter.</li> <li>8. Request U.S. Coast Guard to secure harbor traffic in identified affected areas.</li> </ol> <p><u>NPPP</u></p> <ol style="list-style-type: none"> <li>9. Take actions as indicated B.6. through B.8, previous for an "Alert".</li> <li>10. If required, authorize emergency response personnel and equipment from Bettis and Knolls Atomic Power Laboratories.</li> </ol>	<ol style="list-style-type: none"> <li>7. If necessary, implement notification of the public on conditions at the NNPP facility and provide periodic updates. Coordinate state agency assistance to local governments in alerting the public within the affected area of the emergency status.</li> <li>8. Coordinate state and federal assistance to local government as required.</li> <li>9. Assign Civil Air Patrol /Radio Amateur Civil Emergency Service communications personnel.</li> </ol>



<u>Emergency Classification Level</u>	<u>NNPP Actions</u>	<u>State Actions</u>
	11. If required, provide emergency response personnel and equipment from Naval Reactors Headquarters, other naval shipyards, naval stations, and prototypes.	<p>10. Provide press briefings at JPIC.</p> <p><u>Bureau of Radiological Health</u></p> <p>11. Take action as indicated in B.10 through B.12, previous for an "Alert".</p> <p>12. Provide off-site monitoring to coordinate accident assessment with ECC.</p> <p>13. Locate and track any airborne radioactive plume. Request federal assistance as required.</p> <p>14. Continuously assess information from the Area Commander and off-site monitoring and recommend additional protective actions for the public to the Virginia EOC, as necessary.</p> <p>15. Evaluate need for placing milk animals on stored feed and advise Virginia EOC, if necessary.</p> <p>16. Maintain Emergency status until closeout of emergency class.</p> <p><u>Other State Agencies</u></p> <p>17. Locate and track any airborne radioactive plume. Request federal assistance as required.</p> <p>18. Alert to active status personnel needed to accomplish evacuation tasks.</p> <p><u>Virginia Department of Transportation</u></p> <p>19. Dispatch personnel and be</p>

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<u>Emergency Classification Level</u>	<u>NNPP Actions</u>	<u>State Actions</u>
		<p>prepared to establish roadblocks in support of evacuation and traffic control on advice from the Virginia EOC or local governments.</p> <p><u>Department of Agriculture and Consumer Services and State Water Control Board</u></p> <p>20. Begin monitoring within affected areas as directed by BRH and provide reports to Radiological Assessment Officer at the ECC.</p>

<u>Emergency Classification Level</u>	<u>NNPP Actions</u>	<u>State Actions</u>
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D. General Emergency

<u>1. Class Description</u>	<u>Area Commander</u>	<u>Virginia EOC</u>
<p>Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels off-site for more than the immediate site area.</p> <p>Releases can be expected to exceed EPA PAG exposure levels near the Federal Government property boundary. Releases are expected to result in whole body radiation exposures <math>\geq 1.0</math> Rem or thyroid exposures of <math>\geq 5.0</math> Rem at the Federal Government property boundary.</p>	<ol style="list-style-type: none"> <li>1. Activate the ECC.</li> <li>2. Immediately, notify State and Local Authorities and provide current information on the event.</li> <li>3. Dispatch facility off-site monitoring personnel.</li> <li>4. Activate the News Center. Provide Press Briefings at the News Center in coordination with the State.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take action as indicated in C.1. through C.10, previous for a Site Emergency.</li> <li>2. Activate notification systems to inform public of emergency status and provide periodic updates.</li> <li>3. Keep local governments in the affected area advised of the situation and protective actions to be taken.</li> </ol>
	<ol style="list-style-type: none"> <li>5. Recommend steps to be taken to control access and warn the general public.</li> <li>6. Recommend preparatory steps to be taken for directing the general public in specific areas to evacuate or take shelter.</li> </ol>	<p><u>Director of Information</u></p> <ol style="list-style-type: none"> <li>4. Provide updates to the press through periodic press briefings in coordination with the Area Commander.</li> </ol>
	<ol style="list-style-type: none"> <li>7. Request U.S. Coast Guard to secure harbor traffic in identified affected areas.</li> </ol>	<p><u>Bureau of Radiological Health</u></p> <ol style="list-style-type: none"> <li>5. Take action as indicated in C.11 through C.16, previous for a Site Emergency.</li> <li>6. Supervise dosage of thyroid blocking agent as required.</li> </ol>
<p>2. Purpose</p> <ol style="list-style-type: none"> <li>a. Initiate predetermined protective actions for the public.</li> <li>b. Provide continuous assessment of information from licensee and off-site organization measurements.</li> <li>c. Initiate additional measures as indicated by actual or potential releases.</li> <li>d. Provide consultation with off-site authorities.</li> <li>e. Provide updates for the public through off-site authorities.</li> </ol>	<p><u>Naval Reactors</u></p> <ol style="list-style-type: none"> <li>9. Take action as indicated in C.9. through C.11, previous for a Site Emergency.</li> </ol>	<p><u>Department of Transportation</u></p> <ol style="list-style-type: none"> <li>7. Implement action as indicated in C.19, previous for a Site Emergency.</li> </ol> <p><u>Department of Agriculture and Consumer Services and State Water Control Board</u></p> <ol style="list-style-type: none"> <li>8. Continue actions as indicated in C.20, previous for a Site Emergency.</li> <li>9. Assist farmers in obtaining stored feed for animals, if</li> </ol>

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necessary.

Dept. of Environmental Quality

10. Collect water and fish samples from rivers and lakes located within the affected area in coordination with BRH.

<u>Emergency Classification Level</u>	<u>NNPP Actions</u>	<u>State Actions</u>
E. Recovery/Relocation/Re-entry		
<u>Phase Description</u>	<u>NNPP Area Commander</u>	<u>Dept. of Emergency Management</u>
Events at the NNPP Facility have been downgraded and conditions at the site are stable. Offsite monitoring and assessment continue. Actions are underway by the NNPP and off-site authorities to return impacted area to normalcy.	<ol style="list-style-type: none"> <li>1. Conduct recovery and restoration planning with the state and local jurisdictions.</li> <li>2. Assist the appropriate state and local jurisdictions with radiological information pertaining to recovery and restoration.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take and continue actions as indicated in D.1 through D.10 above.</li> <li>2. Keep local governments in the affected areas advised of the situation and the relaxation or implementation of protective measures.</li> <li>3. Continue to coordinate State and Federal assistance to local governments and the affected population as required.</li> <li>4. Continue to provide press briefings to established public news/media centers.</li> <li>5. Respond to citizen queries concerning the radiological emergency and recovery/re-entry actions as required.</li> <li>6. Provide daily reports and summaries to the Governor's Office on emergency response actions and assistance to impacted communities until instructed otherwise.</li> <li>7. Develop Recovery and Re-Entry Plan.</li> </ol>

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Tab F to Appendix 17

ACCIDENT ASSESSMENT

A. Concept of Operations

1. The Area Commander will perform initial accident assessment as soon as possible after identification of the problem. Results of the assessment, emergency classification level, along with recommended protective actions will be transmitted without delay to the Virginia EOC. If immediate protective actions are required, local governments will be notified on a priority basis. The Bureau of Radiological Health, State Department of Health (BRH) will perform independent follow-on monitoring and assessment. BRH will continue to independently monitor and evaluate the off-site radiological situation to the extent possible until such activities are no longer required. Local governments will conduct radiological monitoring in accordance with their local Radiological Emergency Response Plans and report the results to the Emergency Control Center (ECC).
2. When a reportable incident on-site has occurred, the Area Commander will make an initial report to the State EOC using the Report of Emergency at Tab B. The Area Commander will then make an initial assessment to determine the magnitude of the problem and any projected dose off-site. The Area Commander will notify the State of the initial assessment using the Report of Radiological Conditions at Tab C. After initial notification and reports, the Area Commander will continue to report changes and refinements to the Virginia EOC until off-site radiation levels are low enough that accident assessment is no longer required.
3. Actions specified in Appendix 5 can be executed as coordinated with the Area Commander ECC.

B. Emergency Classification Level Determination

1. A preliminary emergency classification level may be assigned during an accident before any environmental data is available although classification based on dose projections using actual off site environmental data is preferable. In the absence of radioiodine sample results, the radioiodine concentration can be inferred from the direct gamma measurements. This method will most likely over-predict the radioiodine levels by up to several orders of magnitude.
2. An event can be categorized as an "Unusual Event" on a default basis when all the following situations exists:
  - Environmental releases to the harbor or the atmospheric releases are occurring or have occurred
  - Offsite environmental data is not yet available
  - Reactor plant assessment is incomplete
  - The core is not involved
  - A more predictive categorization is not possible

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Tab F to Appendix 17 (Continued)

- Onsite survey data and plant status are known.
3. Accordingly, an event involving core damage and an actual environmental release of fission products may be initially classified as an "Alert" unless information would dictate classification as a "Site Emergency" or "General Emergency". The "Alert" level is considered an appropriate balancing of concerns because core damage implies a level of seriousness above an Unusual Event, and higher levels (Site or General Emergency) involve, as a minimum, warnings to the general public that might not be appropriate. This approach might result in establishing accident categories that might require upgrading later if the situation unexpectedly deteriorates. This is acceptable in view of the desire to inform civil authorities quickly while not unnecessarily causing public panic or concern when immediate action is not required.

C. Dose Assessment Methodology

1. Methods used to perform dose assessment are:

- a. A dose assessment software program written by NNSY personnel which performs a calculation using a Gaussian model of diffusion. This system can provide nearly instantaneous results, and provides certain information not available using the NARAC system. Downwind field measurements must be taken at least 100 meters downwind of the release.
  - b. NARAC generated plots using state-of-the art mathematical models of the atmosphere and particulate and gaseous diffusion of the nuclides (the NARAC site system also provides a calculation using a Gaussian model with automatically updated meteorological data). This system can provide initial plots using default conditions in 15 to 20 minutes after initial notification during normal working hours. For best results, field measurement data should be taken at least one half mile downwind of the release for follow-up plots. This method is used to verify the dose assessment performed using the other methods.
  - c. A manual method of performing a calculation using a Gaussian model of diffusion. Note that method 1 is an automated version of this method; therefore, downwind field measurements must be taken at least 100 meters downwind of the release.
  - d. Note that the Gaussian models provide nearly immediate results, but neglect many factors which affect the diffusion of particles and gases in the atmosphere. The NARAC system provides validation for the Gaussian model methods. Gaussian model methods are the primary means for initial and follow-up dose assessment which will be used for providing protective action or evacuation recommendations to state and local authorities.
2. PAGs have been established so that Early Phase protective actions can be recommended for the general public or implemented for NNPP facility personnel to minimize radiation exposure during a radiological emergency. The PAGs recommended by the EPA are

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Tab F to Appendix 17 (Continued)

expressed in terms of Committed Dose Equivalent (CDE) and Total Effective Dose Equivalent (TEDE) to the general public. The CDE PAG is the sum of the effective dose equivalents from:

- External exposure to the plume (“plume shine”),
  - Committed Effective Dose Equivalent (CEDE) from all significant inhalation pathways (e.g. thyroid),
  - Four day, external exposure to gamma radiation from deposited material (“ground shine”).
3. The EPA PAGs note that whole body and thyroid dose methodology generally affords the same level of public health protection as TEDE and CDE methodology. However, for releases that contain a smaller fraction of radionuclides than the accident scenarios analyzed in the PAG manual, the TEDE/CDE based PAGs are slightly more protective.
  4. For planning purposes and initial dose evaluations, one of two situations will most be considered. Either there will be releases of radioiodine and noble gasses that approach regulatory guide assumptions or there will be significant scrubbing of radioiodine (and particulates) and mostly noble gasses will be released. In the first case, thyroid dose clearly will be most limiting. In the latter case, external radiation whole body dose may be most limiting.
  5. TEDE/CDE dose assessment calculations are somewhat complex and will take more time to complete than whole body/thyroid dose calculations. Accordingly, the NNPP approach to rapid assessment of separate cloud shine dose and radioiodine thyroid dose during the duration of the plume (vice TEDE for 4 days and CDE dose assessment) is considered appropriate for initial accident categorization and protective action recommendations. As actual plume composition data becomes available, TEDE/CDE dose plots from the National Atmospheric Release Advisory Capability (NARAC) program will assist in subsequent dose assessments.

C. Meteorological Data

A NARAC metdata tower is installed at each NNPP facility. These towers are capable of providing local meteorological data. If a site metdata tower is not operational, then meteorological data may be obtained from the following off-site resources:

- Norfolk International Airport (757) 460-9348

Newport News / Williamsburg International Airport (757) 874-3682

D. Field Monitoring Teams

1. Radiological Monitoring Capabilities. NNPP facilities has the capability to detect iodine in the presence of noble gas at levels of  $10^{-7}$  uCi/cc through the use of portable air



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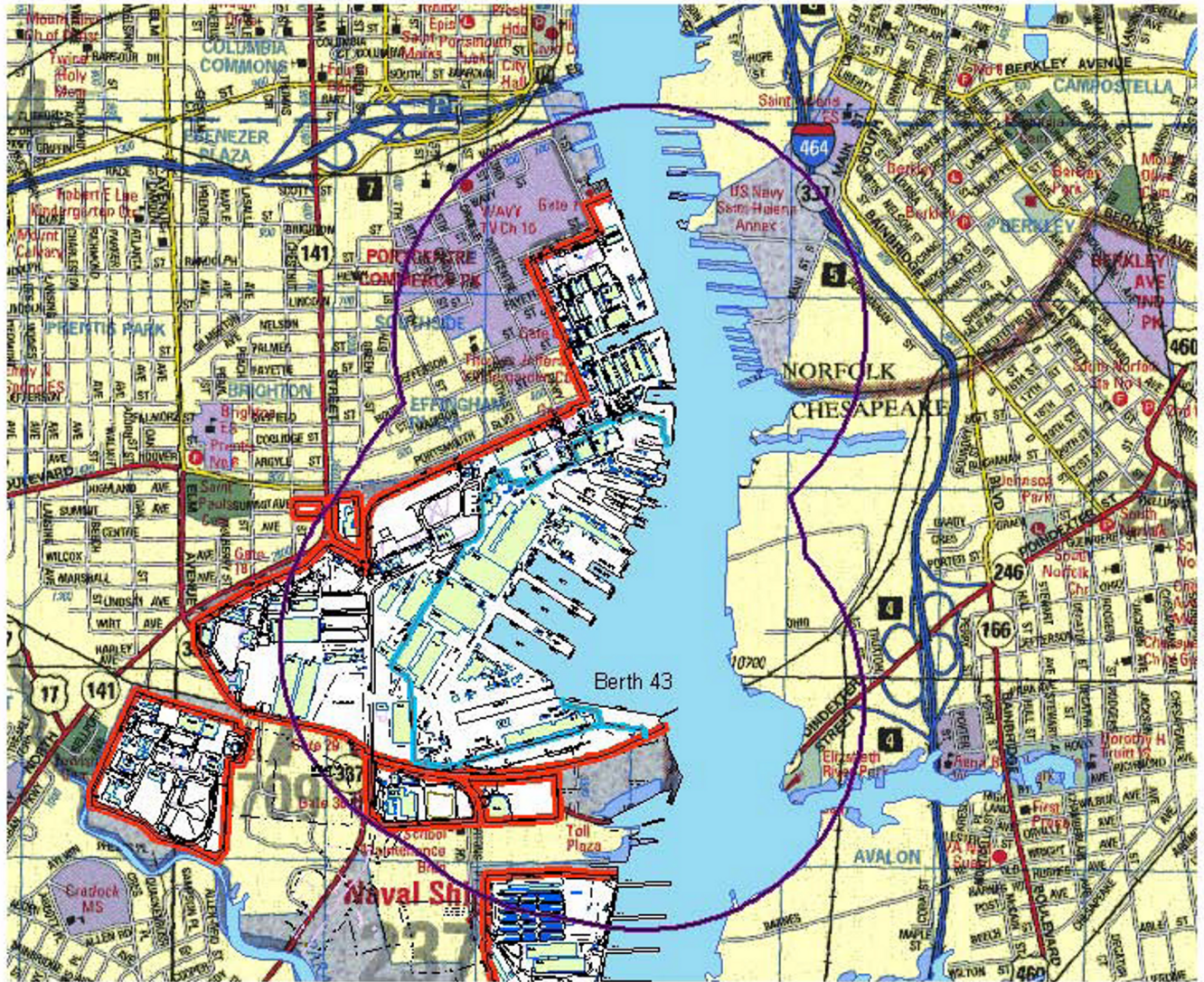
Tab F to Appendix 17 (Continued)

samplers. Additional capabilities include mobile laboratories to provide gamma spectroscopy and aerial monitoring assisted by Naval Air Station, Norfolk.

2. Perimeter Monitoring. Perimeter monitoring includes surveys for gamma radiation, airborne particulate and radioiodine activity, and surface contamination at the Federal Government property boundary. The results of perimeter monitoring surveys are used to determine the scope, magnitude, and trend of the casualty and are used to make dose projections for the public in downwind sectors. Two monitoring teams immediately deploy downwind to the perimeter as quickly as possible following notification of a radiological emergency.
3. Off-Site Monitoring. Off-site monitoring includes surveys for gamma radiation, airborne particulate and radioiodine activity, and surface contamination. In the event of an emergency, which is likely to release airborne radioactivity outside the Federal Government property, off-site monitoring is promptly initiated in downwind areas. As a minimum, two monitoring teams are available. The results of off-site monitoring are used to confirm or refine dose projections and to modify or continue protective actions in effect or being considered.
4. Water Monitoring. Water monitoring includes surveys for gamma radiation, airborne particulate and radioiodine activity, and water activity. The results of water monitoring are used to determine protective actions necessary for personnel, ships, and facilities normally in affected waterways. As a minimum, one monitoring team composed of two persons plus a boat operator should be available to support water monitoring.
5. Aerial Monitoring. Aerial monitoring using portable survey instruments is intended to provide an initial estimate of the radioactivity released to the atmosphere and the radioactivity distributed over ground level areas. The information obtained is used to identify areas of primary concern, to direct the efforts of the off-site ground monitoring teams and to provide a basis for further aerial monitoring conducted by DOE if they became involved. Aerial monitoring provides a method for rapidly surveying large areas that could not be surveyed promptly by ground monitoring teams.

Tab G to Appendix 17  
Figure 1

Norfolk Naval Shipyard Area of Planning Attention



Area of Planning Attention  
Base Perimeter