UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

October 20, 1983

MEMORANDUM FOR: Edward L. Jordan, Director
Division of Emergency Preparedness and
Engineering Response
Office of Inspection and Enforcement

FROM: Robert M. Bernero, Director
Accident Source Term Program Office
Office of Nuclear Regulatory Research

SUBJECT: EMERGENCY RESPONSE PLANNING IN TAIWAN

On September 23 to September 27, 1983 I was in Taipei, Taiwan, on a periodic visit associated with the NRC-RES agreement to provide technical assistance to the Atomic Energy Council and Taiwan Power Company (TPC) for the conduct of a full scope probabilistic risk analysis of one of their U.S.-designed BWRs. In the course of that visit I received a briefing on and a tour of their emergency preparedness program and the central emergency control center. The attached figure shows the TPC generating units and the grid. TPC has four nuclear units in operation now at the 1st Nuclear Station (2 GE BWR-4, 636 MWe each) and the 2nd Nuclear Station (2 GE BWR-6, 985 MWe each). Two more units at the 3rd Nuclear Station (2 3-loop Westinghouse PWR, 951 MWe each) should start up in 1984. The population on Taiwan is about 20 million; the capital city of Taipei, with about 2 1/2 million of those people, is at the north end of the island (the cluster of substations between Linkou and Shenao on the attached map). The Central Emergency Control Center is located on the top floor of the 27-story TPC building in Taipei; it shares that floor with the TPC Dispatch Center.

The three attachments are notes and slides which I received there. Please note that the Central Emergency Control Center is also used for non-nuclear emergencies, such as the frequent typhoons which often take out major power lines. In addition, their nuclear data link (see CRT's on page 9 of Attachment D) is used during normal business for the TPC headquarter's fuel management group.

I was favorably impressed by their whole arrangement. They have taken advantage of short distances and a central location to establish a single, admirably equipped emergency center for the utility and the government. Note that the central facility is in Taipei but there is a near-site EOC closer to the plants. They have not yet developed firm plans on what to add for the 3rd Nuclear Station (about 350 miles south of Taipei).

Another outstanding problem is that of dose projections. The 1st and 2nd Nuclear Stations are right on the shoreline and separated from Taipei by very mountainous terrain. They have installed a network of monitoring stations all through there but projections are virtually impossible.

Please call me if you wish further information.

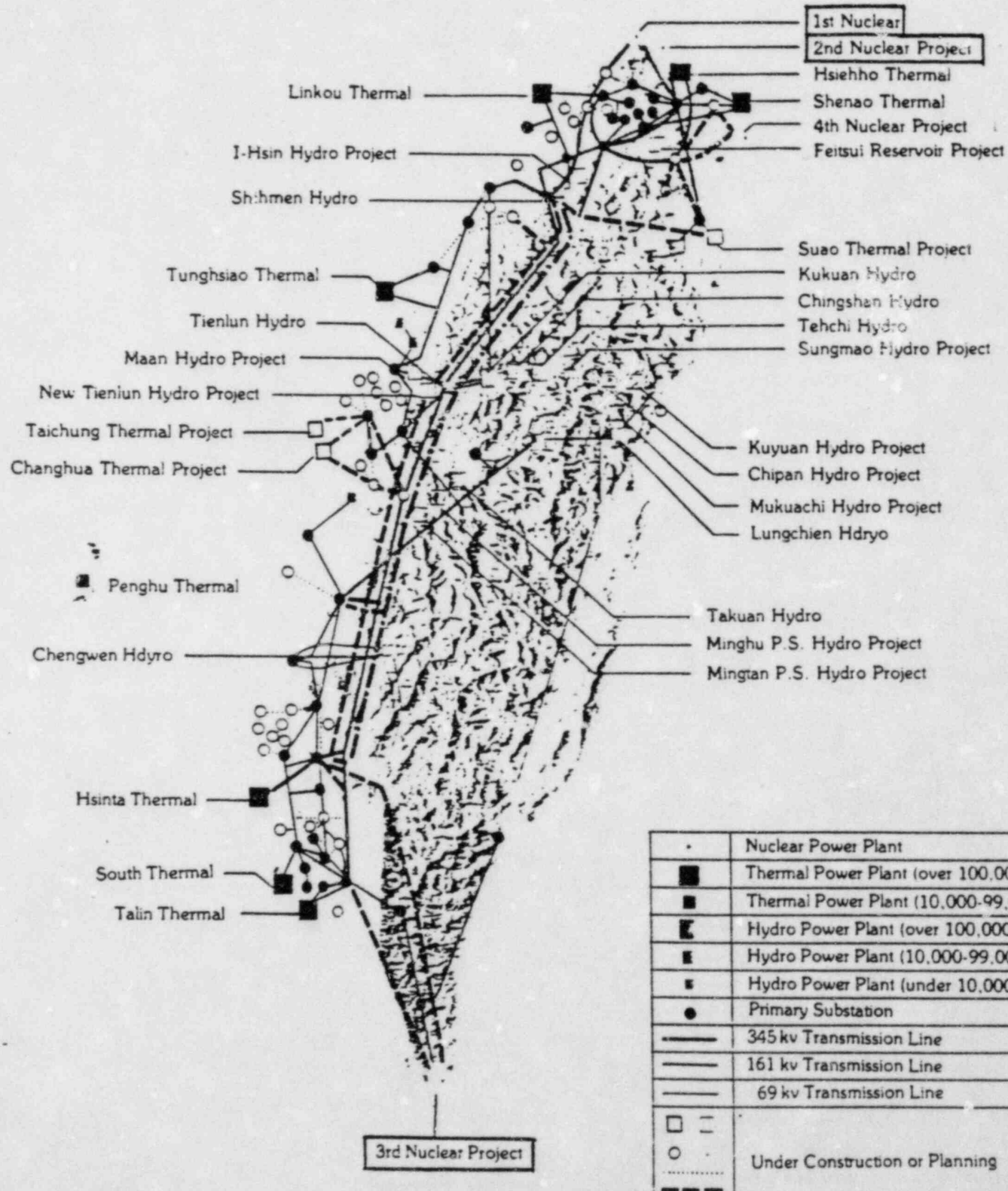
Robert M. Bernero, Director
Accident Source Term Program Office
Office of Nuclear Regulatory Research

Attachments: As Stated

cc: T. Speis
K. Goller
V. Stello
M. Ernst
D. Matthews
L. Soffer

FACILITIES AND SYSTEM

Installed Capacity 1982: 11,869,000 kilowatts
Esitmated Capacity for 1992: 16,869,000 kilowatts



SUMMARIES OF

TAIPOWER NUCLEAR EMERGENCY PREPAREDNESS PROGRAM

The Taipower's Emergency Preparedness Program had been actively initiated since early 1976 before the First Nuclear Power Station loaded its initial core. Meanwhile the Taipower "Emergency Plan Guidelines" was promulgated as the planning basis of each nuclear power station, and, had established emergency response plan at various levels. In light of lessons learned from TMI-incident in 1979, Taipower revised the said emergency response plans, and ROC/AEC formulated the "National Nuclear Emergency Response Plan" in 1981.

Based on Taipower's "Emergency Planning Guidelines", and in accordance with different site specificities, each nuclear power station had developed their own emergency response plan & implementation procedure which contains five basic elements, i.e.,

1. responsibility of emergency planning,
2. emergency organizations & facilities,
3. emergency conditions & classifications,
4. emergency functions,
5. training & drill.

In compliance with the National Emergency Plan, the responsibility of planning and implementing all emergency measures within the site boundary rests with Taipower; the planning and implementing protective actions for near-site residents is a coordianted effort of the related governemnt agencies such as Min. of Economic Affairs, Min. of National Defense, ROC/AEC, etc. and Taipower.

In the event of an emergency, the plant superintendent or his designated representative will act as the emergency controller, and all other plant staffs and workers will be separately assigned to nine different emergency response teams. The pre-set on-site TSC, HPC & OSC will function as emergency response center for special tasks respectively.

Being notified of the emergency, Taipower's Nuclear Emergency Planning Executive Committee (NEPEC) will be summoned to the Central Emergency Control Center at headquarter office and start to carryout its duty of accident assessment, technical instruction, and emergency support to the plant. If the emergency happens to be serious enough with a potential hazard to the health and safety of near-site residents, Taipower will notify ROC/AEC. The Secretary General of ROC/AEC will then call the National Emergency Management Committee to take actions. Under the National Committee there are three emergency operation facilities, i.e.,

1. Near Site Emergency Operations Center,
   - off-site radiation levels survey, assessment of the accident.
2. Civil Nuclear Emergency Response Center,
   - notification of the population to take shelter or to evacuate, provision of food and housing to the evacuees.

3. Regional Garrison Command.

- traffic control and sentry duties, providing vehicles for evacuation.

As for the emergency action levels, four classes are established, they are:

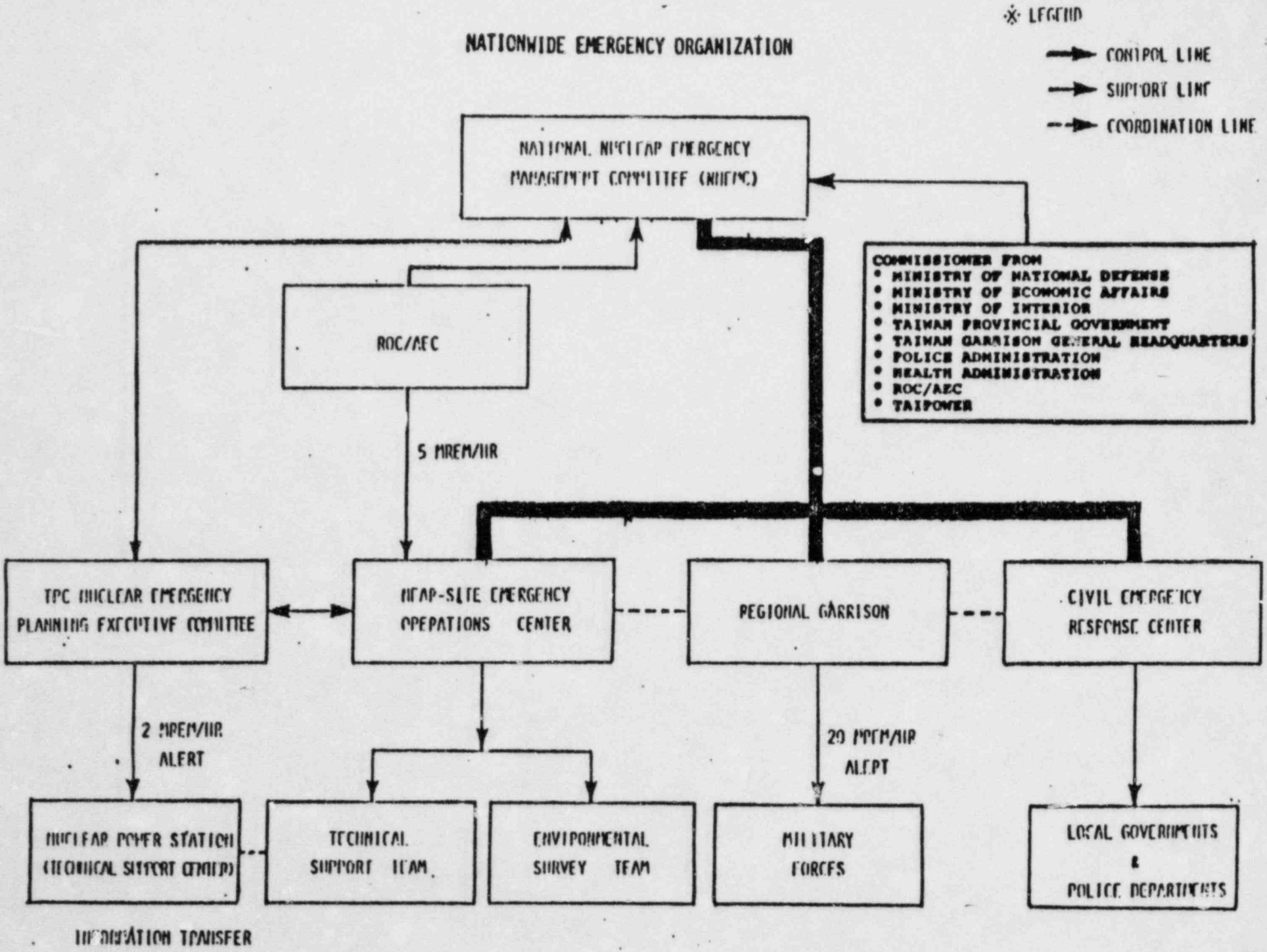
- Notification of Unusual Event,
- Alert,
- Site Area Emergency,
- General Emergency.

These classes are the same as those defined in NRC NUREG-0610, published in September 1979.

Emergency functions include notification & activation, assessment actions, mitigation actions, and protective actions. To ensure that these actions can be carried out effectively and timely during an emergency, the training of employees and periodic drills of emergency plans are extremely necessary. Since their first fuel loading, each of Taipower's nuclear power plant has conducted their own emergency exercise annually. A joint emergency exercise between Taipower Headquarter and the First Nuclear Power Station was conducted in March this year.

ATTACHMENT C

NATIONWIDE EMERGENCY ORGANIZATION



PROPOSED PROTECTIVE ACTION GUIDE

(1) PROTECTIVE ACTION GUIDE

LEVEL	PROJECTED DOSE		MEASURES	OBJECTS
	WHOLE BODY (REM)	THYROID (REM)		
I	1 - 5	10 - 50	STAY AT HOME	INFANTS, CHILDREN AND PREGNANTS
II	5 - 10	50 - 100	STAY AT CONCRETE BUILDING OR EVACUATION TO SAFE AREA	INFANTS, CHILDREN AND PREGNANTS
			STAY AT HOME	ADULT
III	OVER 10	OVER 100	STAY AT CONCRETE BUILDING OR EVACUATION TO SAFE AREA (REMOTE)	ALL

(2) FOOD CONTROL GUIDE

FOOD	MEASURED I-131 RADIOACTIVITY CONCENTRATION
DRINKING WATER	3×10^3 PCi/l
VEGETABLE	2×10^2 PCi/GR
MILK	6×10^3 PCi/l

ATTACHMENT D

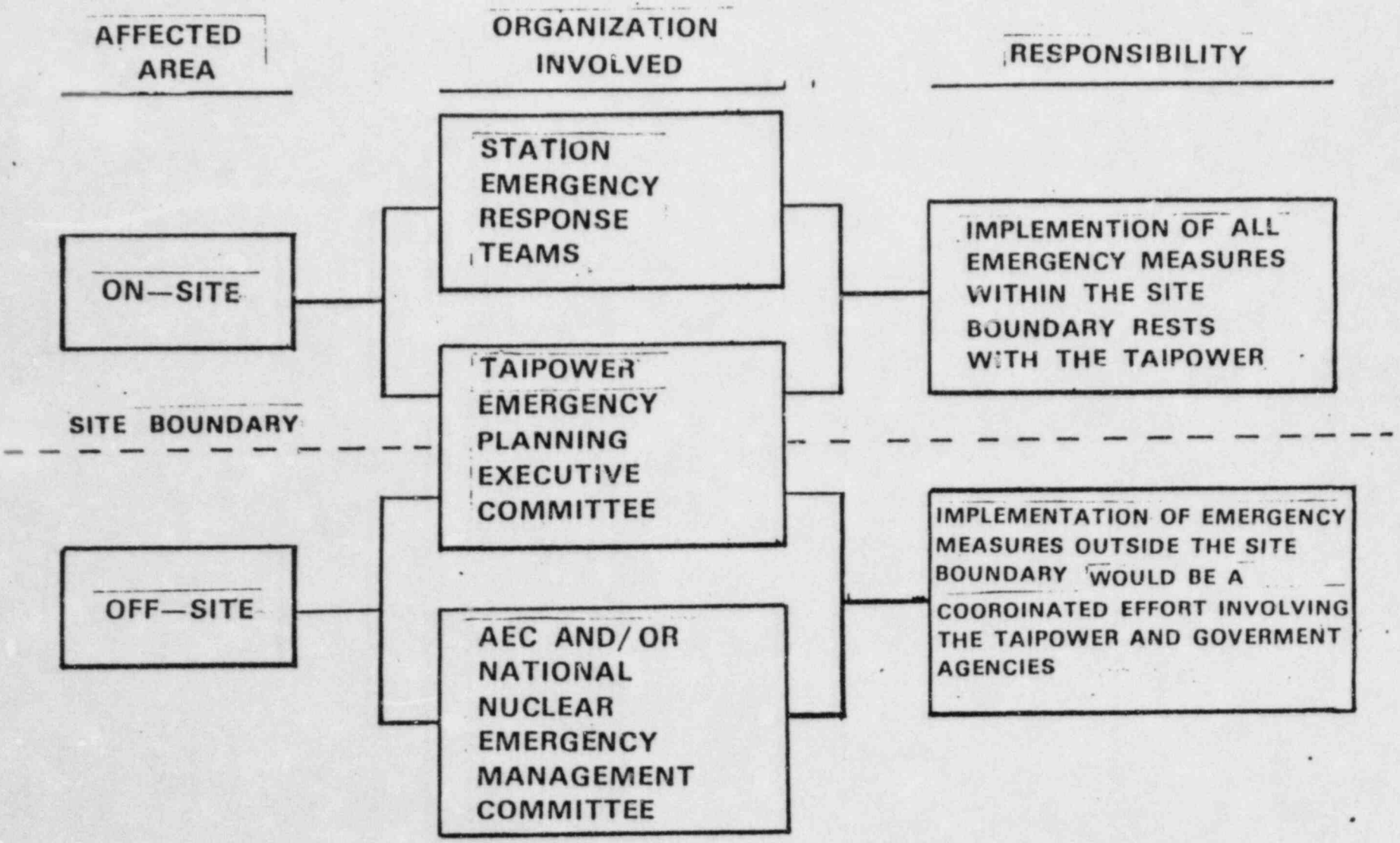
BRIEFING ON TAIPOWER NUCLEAR EMERGENCY PREPAREDNESS PROGRAM AND CENTRAL EMERGENCY CONTROL CENTER

TAIPOWER NUCLEAR EMERGENCY PLANNING
EXECUTIVE COMMITTEE

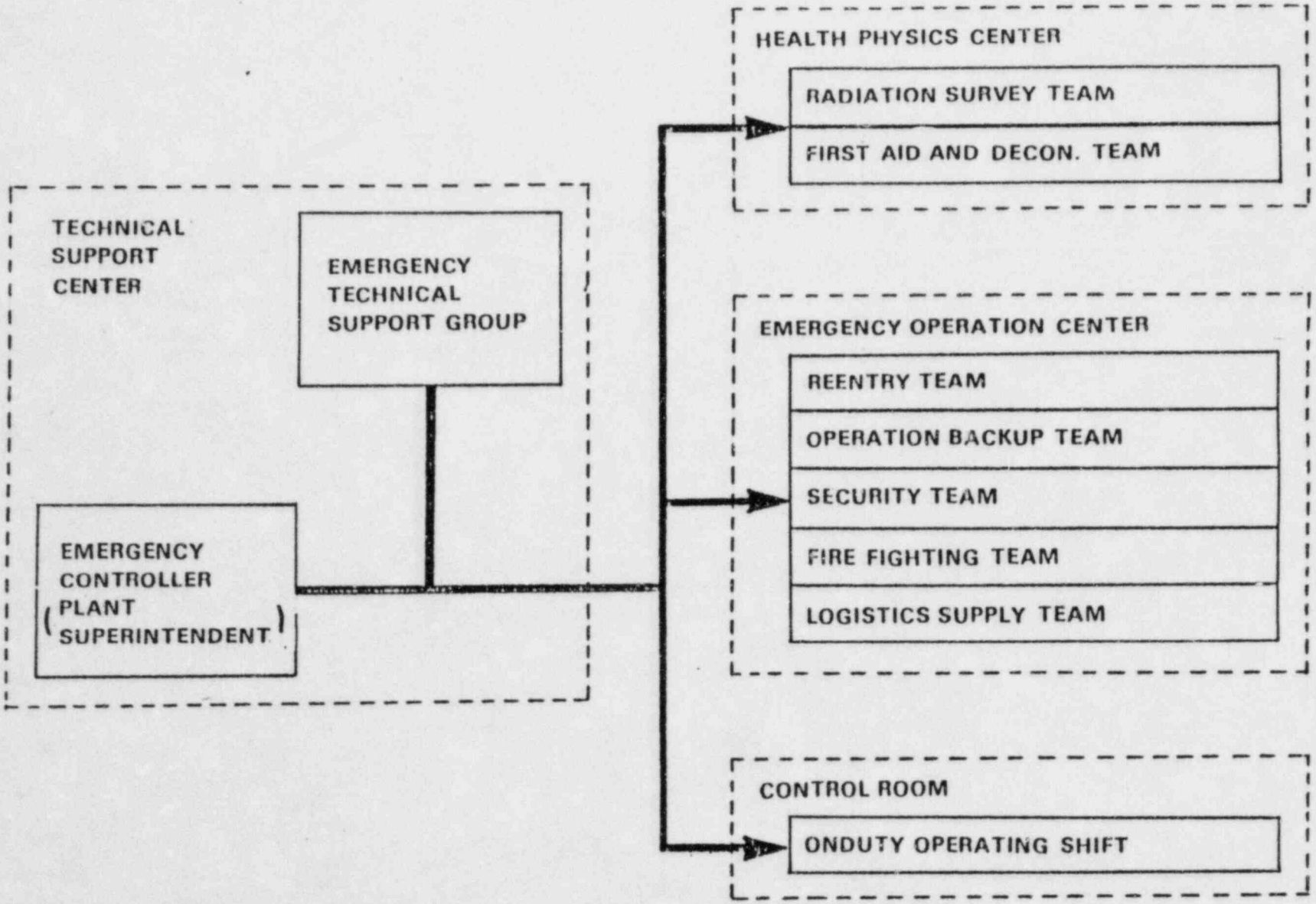
EMERGENCY PREPARDNESS PROGRAM OVERVIEW

- EMERGENCY ORGANIZATION AND RESPONSIBILITY
- EMERGENCY FACILITIES
- ARRANGEMENT OF THE TAIPOWER CENTRAL EMERGENCY CONTROL CENTER
- EMERGENCY FUNCTIONS
- EMERGENCY TRAINING ANG DRILLS
- CURRENT ACTION PLANS

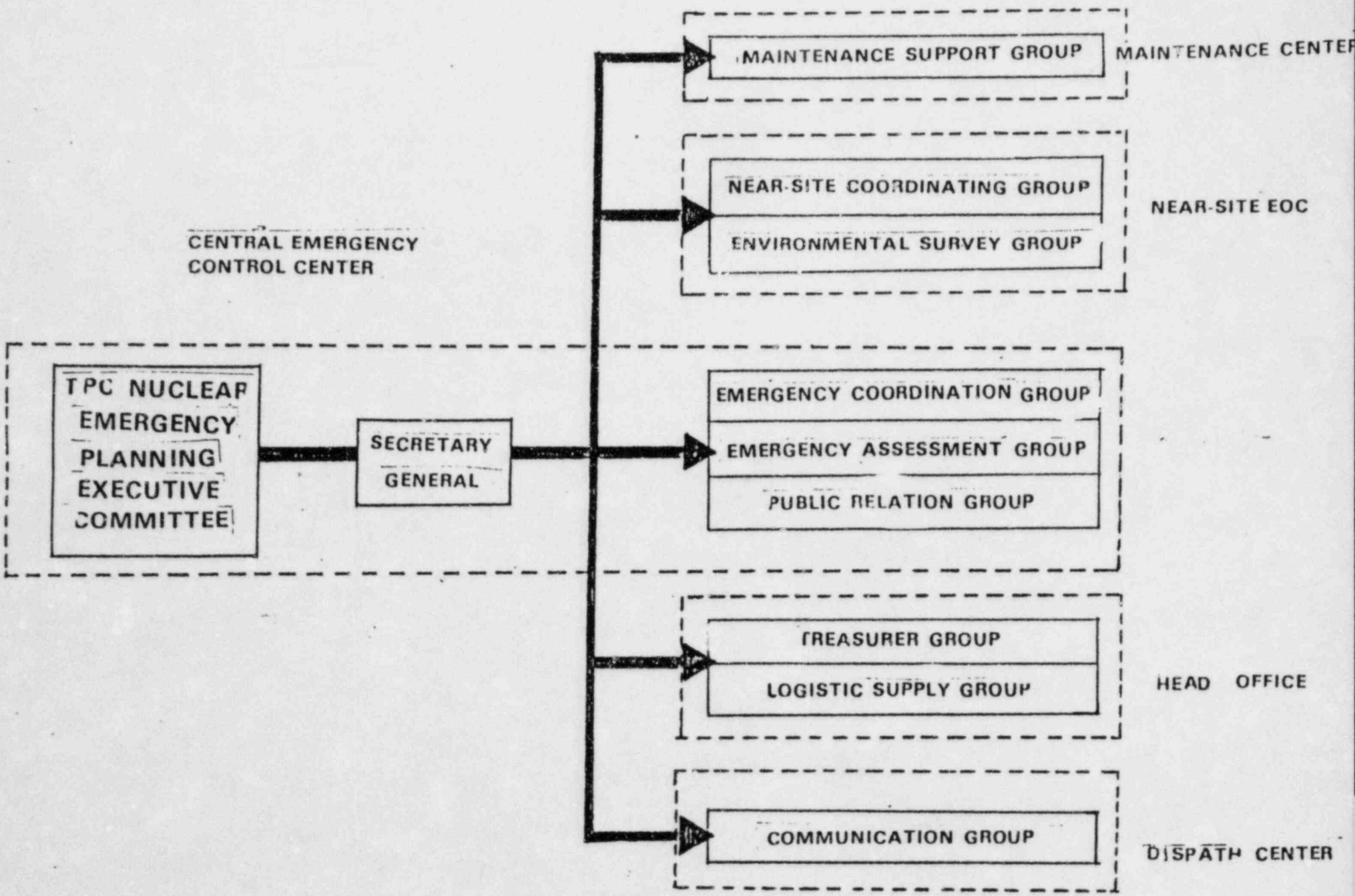
EMERGENCY ORGANIZATIONS AND RESPONSIBILITIES.



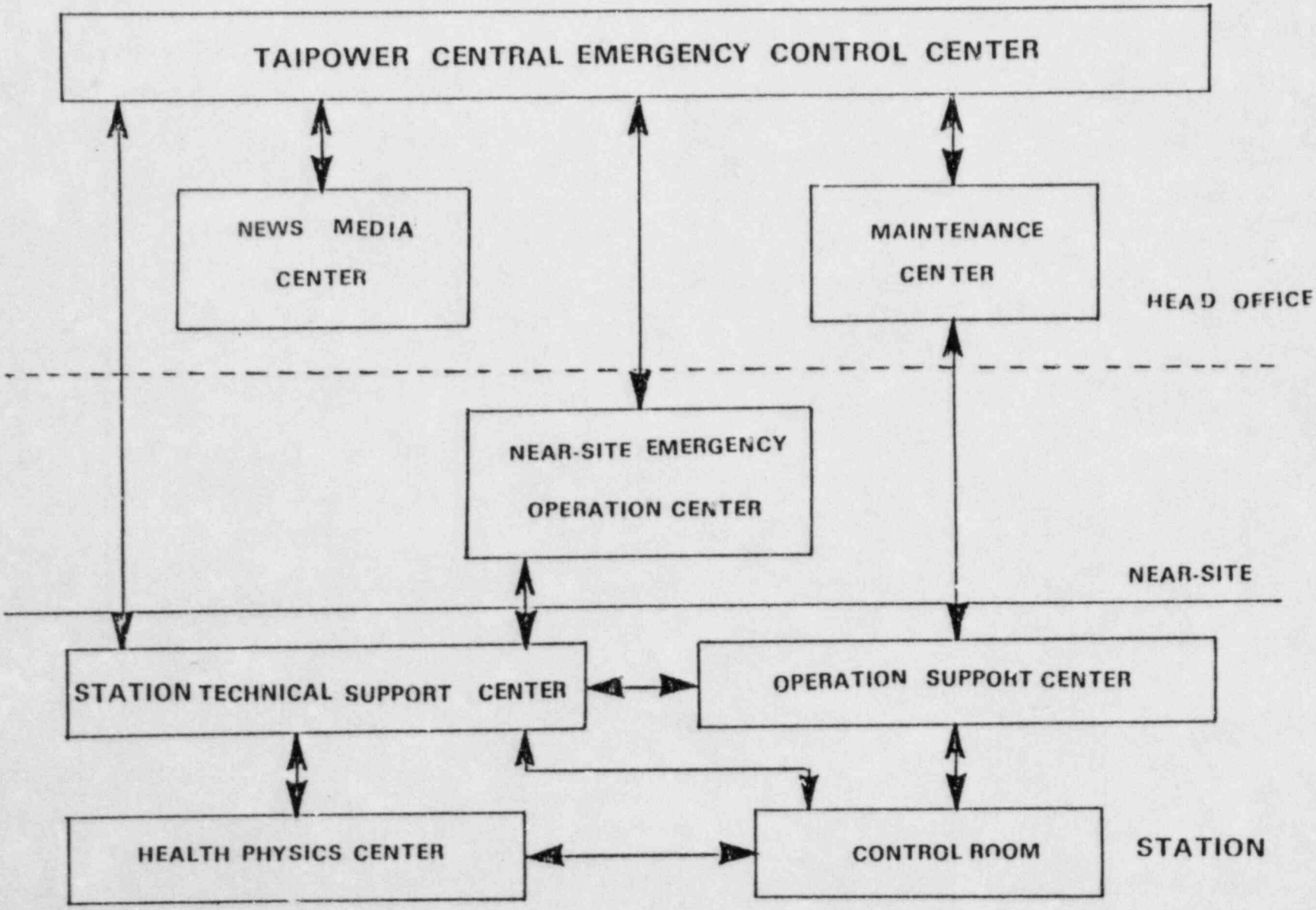
STATION EMERGENCY ORGANIZATIONS AND FACILITIES



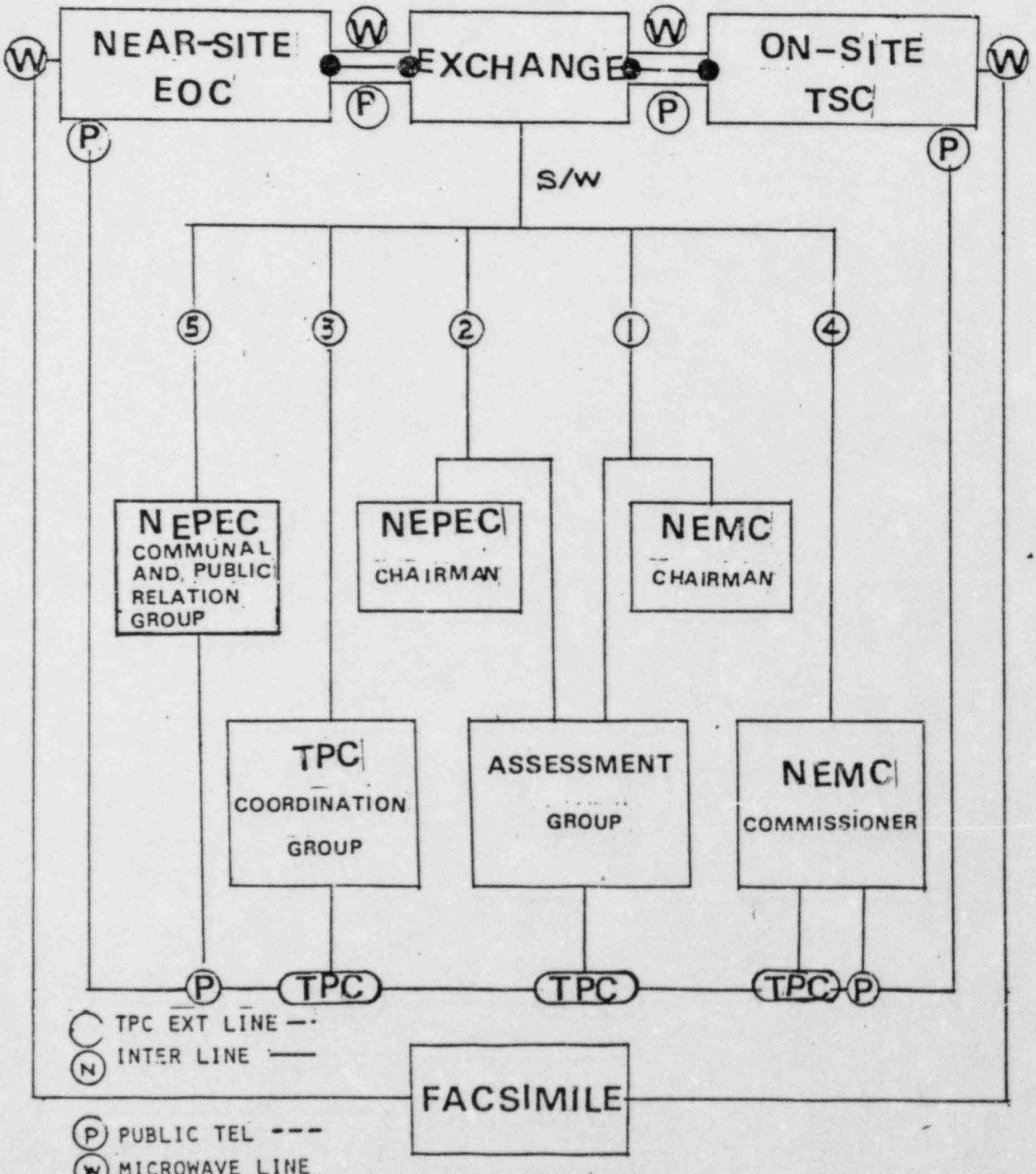
HEAD OFFICE EMERGENCY ORGANIZATIONS AND FACILITIES



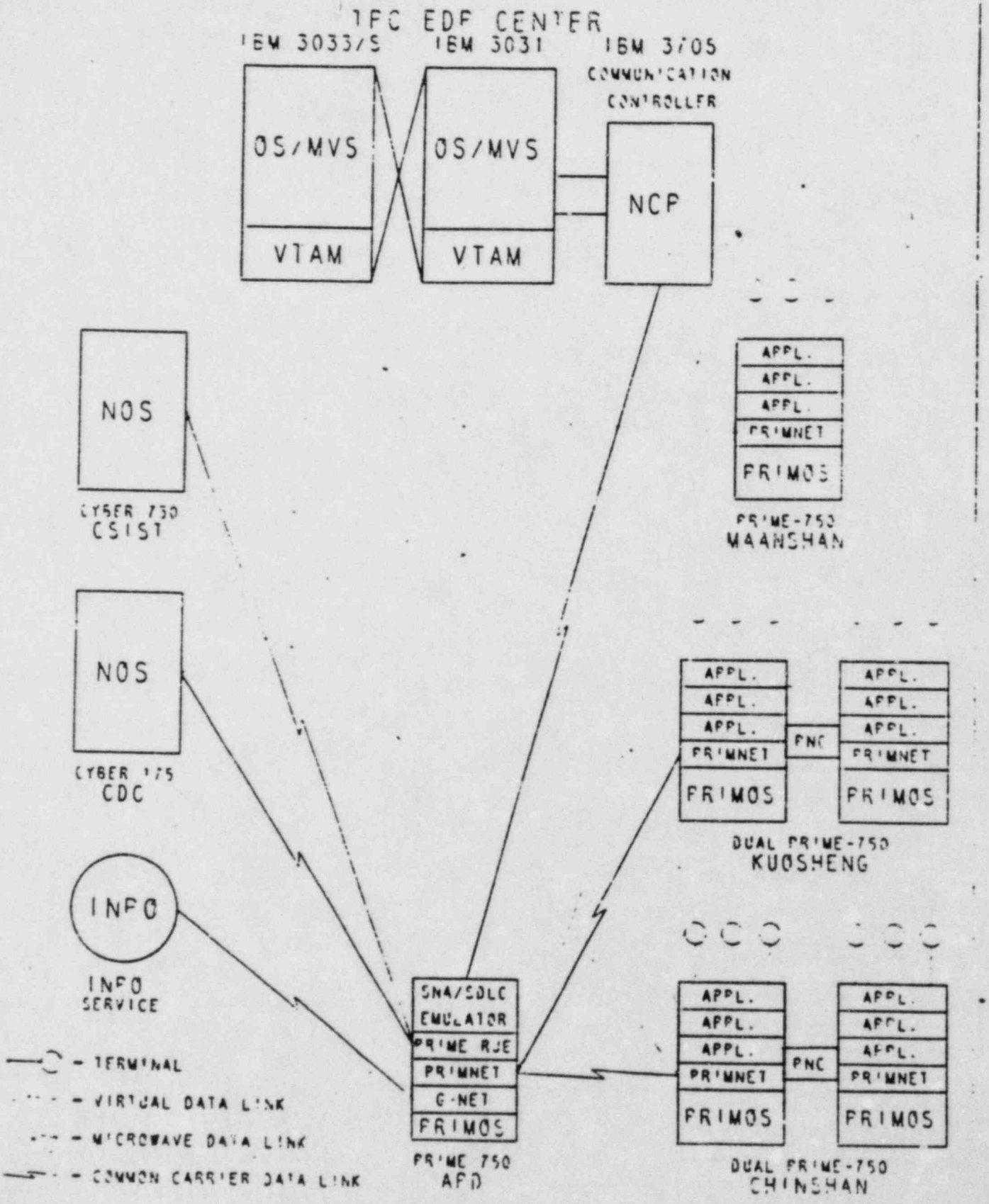
EMERGENCY FACILITIES



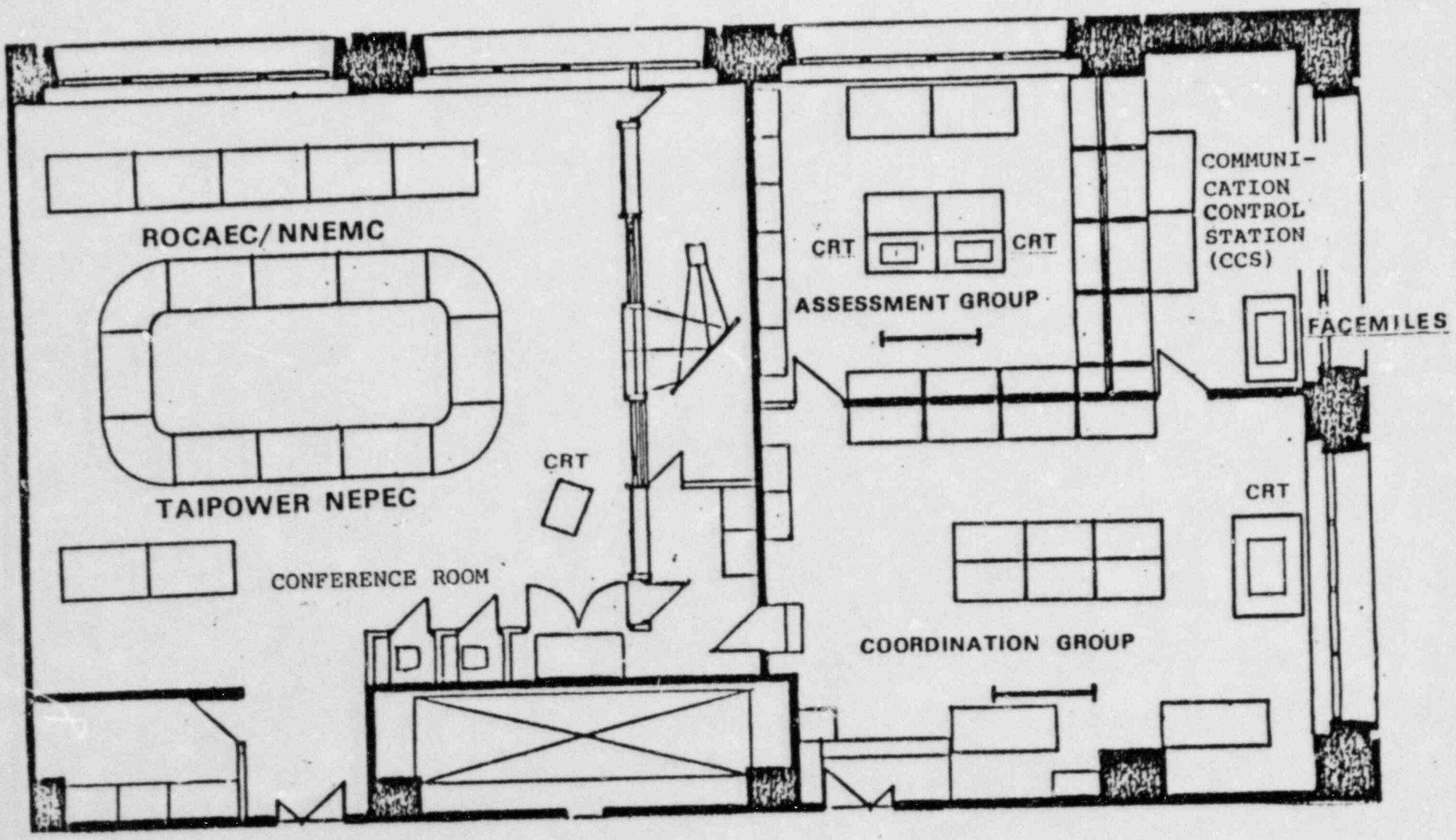
CECC COMMUNICATION FLOW



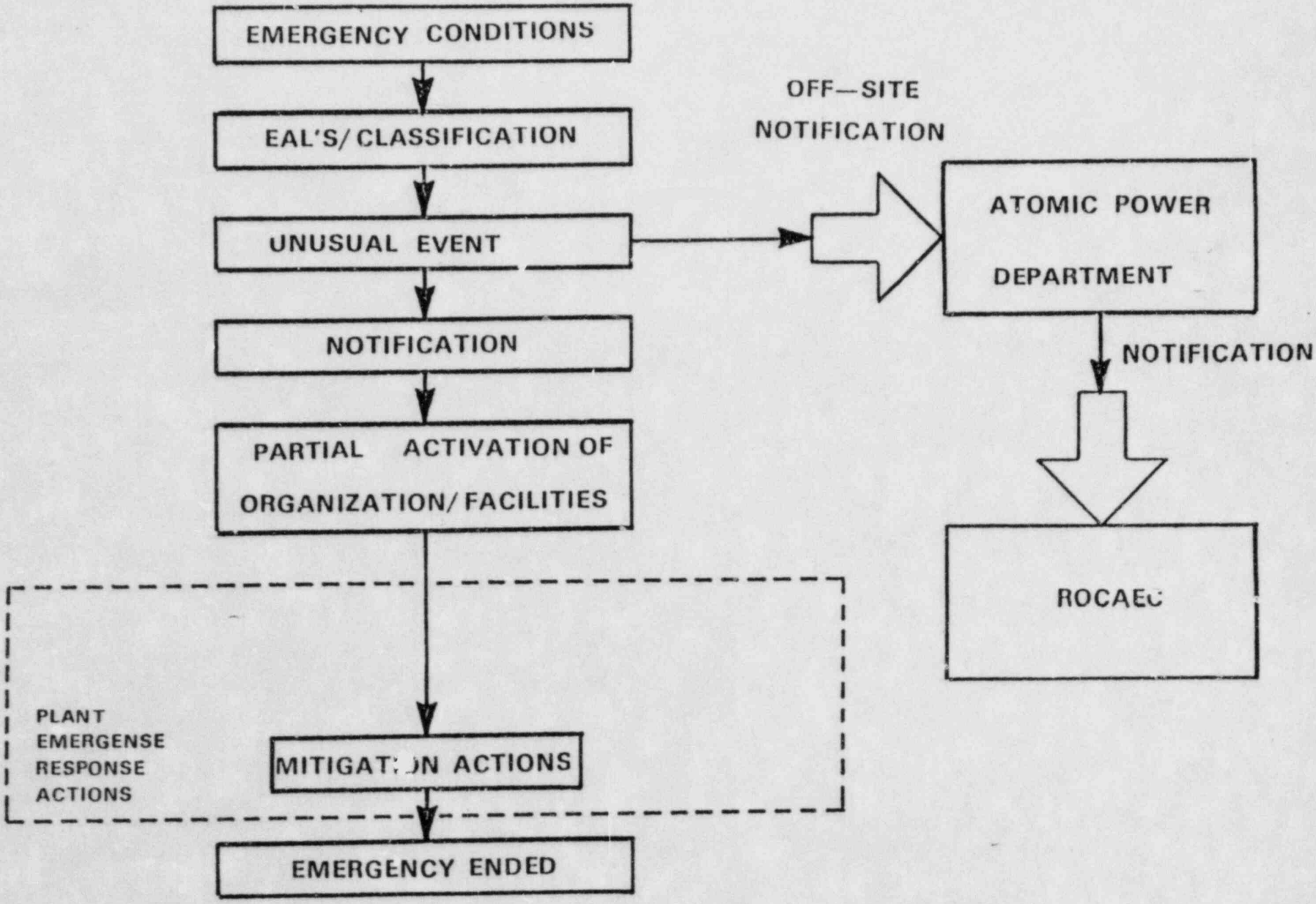
• DISTRIBUTED NUCLEAR INFORMATION SYSTEM

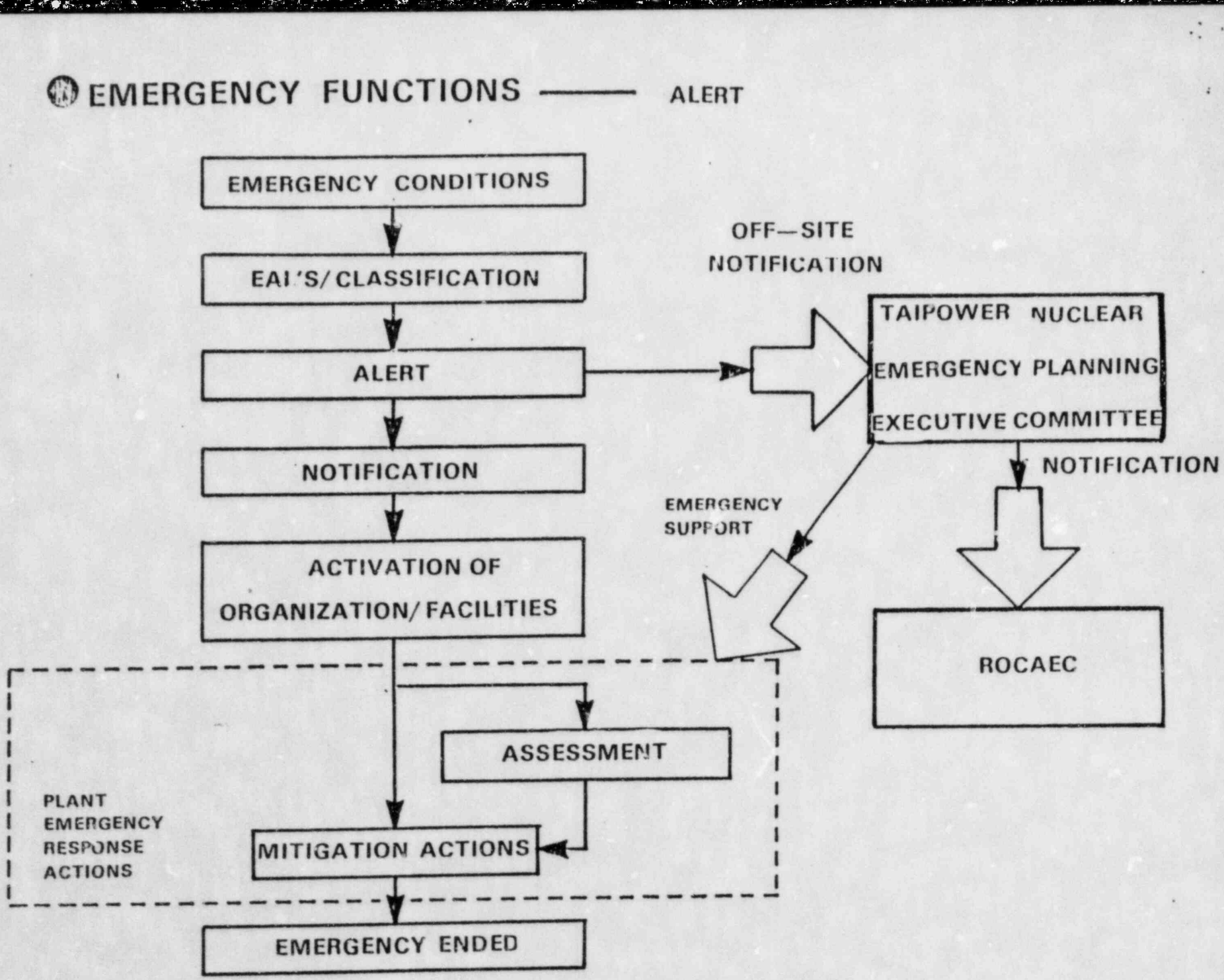


CENTRAL EMERGENCY CONTROL CENTER

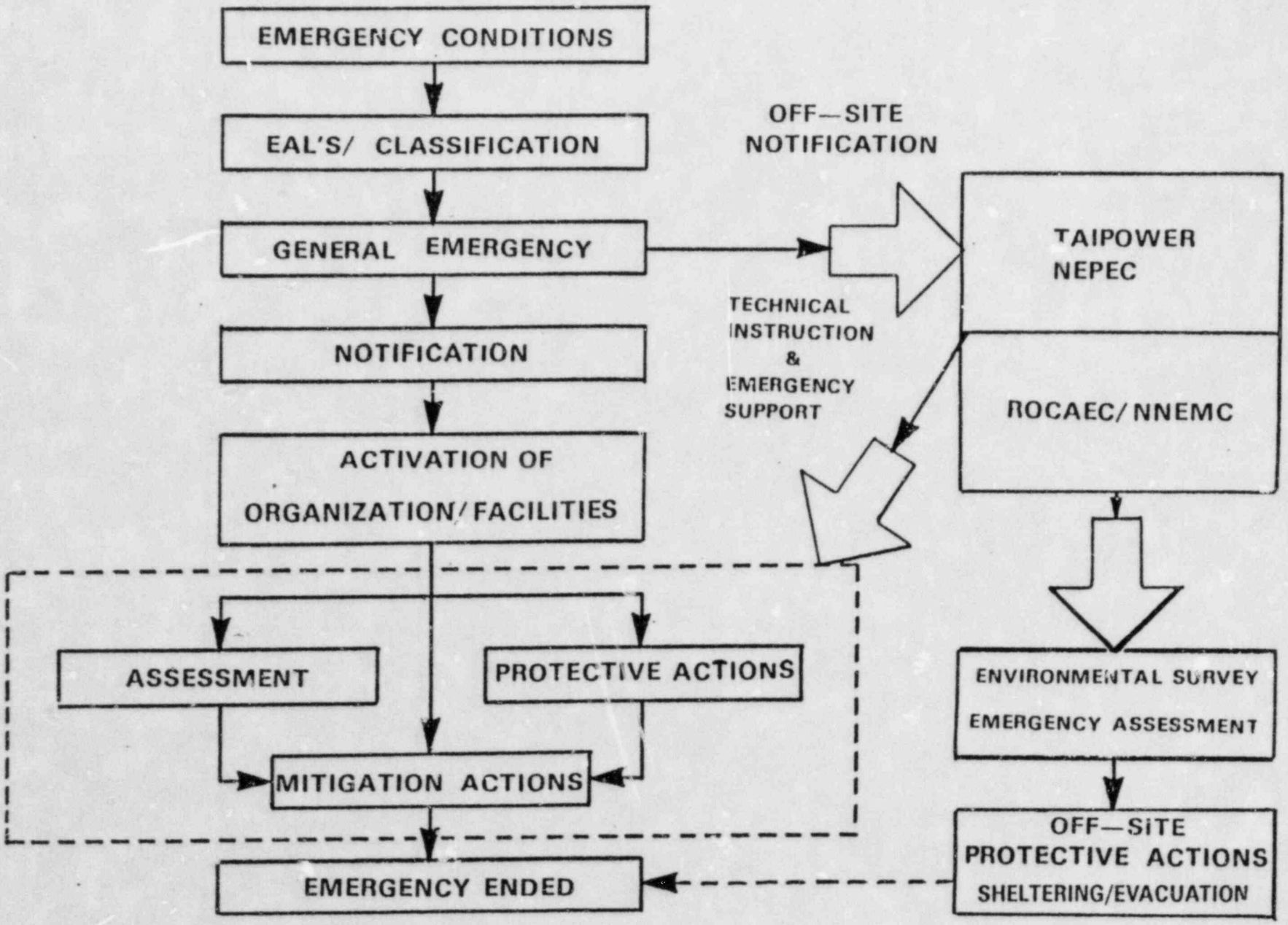


EMERGENCY FUNCTIONS —— UNSUAL EVENT




EMERGENCY FUNCTIONS —— ALERT
EMERGENCY CONDITIONS
EAI'S/CLASSIFICATION
ALERT
NOTIFICATION
ACTIVATION OF ORGANIZATION/FACILITIES
OFF—SITE NOTIFICATION
TAIPOWER NUCLEAR EMERGENCY PLANNING EXECUTIVE COMMITTEE
NOTIFICATION
EMERGENCY SUPPORT
ROCAEC
ASSESSMENT
PLANT EMERGENCY RESPONSE ACTIONS
MITIGATION ACTIONS
EMERGENCY ENDED

EMERGENCY FUNCTIONS —— GENERAL EMERGENCY



• EMERGENCY TRAINING AND DRILLS

– AN INITIAL TRAINING AND DRILL IS CONDUCTED PRIOR TO FUEL LOADING OF THE FIRST UNIT AT ANY SITE.

– PERIODIC TRAINING AND DRILL IS CONDUCTED IN EACH STATION ANNUALLY.

– A JOINT EMERGENCY EXERCISE BETWEEN TAIPOWER HEAD OFFICE AND THE FIRST NUCLEAR POWER STATION WAS CONDUCTED IN MARCH THIS YEAR.

- CURRENT ACTION PLANS

  - TO ESTABLISH THE PERMANENT ERFS.
  - TO INSTALL SPDS AND DATA LINK FOR EACH ERF.
  - TO UPGRADE THE ON-SITE AND OFF-SITE COMMUNICATION SYSTEM.
  - TO BUILDUP EMERGENCY ASSESSMENT AND RADIOLOGICAL ANALYSIS CAPABILITIES.
  - TO COMPLETE IMPLEMENTING PROCEDURES FOR EACH EMERGENCY ORGANIZATION.
  - TO CONDUCT THE RETRAINING FOR EACH EMERGENCY GROUP.

• DISTRIBUTED NUCLEAR INFORMATION SYSTEM