

公務出國報告

(出國類別：訪問)

日本九州玄海核能電廠 核安演習國際觀摩 出國報告

服務機關：行政院原子能委員會

姓名職稱：蘇軒銳執行秘書、黃朝群技士

派赴地區：日本九州

出國期間：106年9月1日至106年9月5日

報告日期：106年10月17日

摘 要

2011 年日本東北大地震引發福島第一核能發電廠核子事故，世界各國除關注核能電廠各項安全措施之強化，將其落實在平時整備與緊急應變上亦是非常重要的一環，日本內閣府自 2016 年起開始邀請我國觀摩該國年度核安演習，該演習規模類似我國核安演習，參與單位包括中央、地方相關公私部門及核能電廠業者等，今年(2017 年)已是第二次，本次觀摩有助於我國精進核安演習，以及核子事故應變機制等各項作為。

關鍵字：核安演習、核子事故

目 錄

壹、出國目的	1
貳、出國行程	2
參、過程紀要	3
肆、心得與建議	17
伍、附件.....	18

壹、出國目的

2011年3月11日，日本東北地區遭受地震引發海嘯侵襲，福島第一核能發電廠因此發生嚴重核子事故，並釋放出大量放射性物質。原能會針對福島核能發電廠核子事故，除採取邊境管制作為外，同時檢討國內核能電廠現有機組因應類似情形之事故應變能力，於101年8月完成「國內核能電廠現有安全防護體制全面體檢方案」總檢討報告，期獲取經驗，防範未然。

日本內閣府於2016年首次以官方身分邀請我國觀摩2016年11月12至14日北海道泊(Tomari)核能電廠之核安演習(Nuclear Energy Disaster Prevention Drill)，今(2017)年係第二次邀請我國派員觀摩，觀摩地點為九州玄海(Genkai)核能電廠。日本的核安演習參與單位包括中央、地方相關公私部門及核能電廠業者，其動員規模與我國核安演習做法類似。本次藉由觀摩學習與相互意見交流，瞭解日本辦理核安演習做法及緊急應變作為，除可檢討我國核子事故應變機制不足處，亦可精進未來核安演習規劃。

貳、出國行程

本次出國行程含往返共計五日，行程表如下：

日期	行程內容
9月1日 (五)	去程(桃園機場→福岡機場→日本佐賀)
9月2日 (六)	核安演習觀摩前說明會(佐賀)
9月3日 (日)	核安演習觀摩(佐賀、長崎)
9月4日 (一)	核安演習觀摩(佐賀)
9月5日 (二)	回程(日本佐賀→福岡機場→桃園機場)

參、過程紀要

日本 2017 年核安演習(2017 Nuclear Energy Disaster Prevention Drill)，於 9 月 3 日至 4 日舉行，本次觀摩除我國外，還有美國、俄羅斯、芬蘭、南韓、國際原子能總署、OECD/NEA 等國家或國際組織參加。本次演習擇定九州玄海(Genkai)核能電廠辦理，該核能電廠位於九州北部佐賀縣玄海町海岸，隸屬於九州電力公司，廠內共設有四部壓水式機組，一號機於 1975 年運轉(最早)，4 號機於 1997 年運轉(最晚)，目前 1 號機正在進行除役，二號機及三號機已停止運轉，四號機則準備再啟動。

日本福島事故後，核能電廠緊急應變計畫區(Emergency Planning Zone, EPZ)係參考國際原子能總署建議，劃分為 PAZ(Precautionary Action Zone)及 UPZ(Urgent Protective Action Planning Zone)，其範圍分別為 0~5 公里及 5~30 公里。以玄海核能電廠為例，PAZ 範圍包含佐賀縣之玄海町及唐津市，依據 2016 年 4 月戶政統計資料，人口總數為 8 千 126 人；UPZ 範圍則包含佐賀縣三市町(玄海町、唐津市、伊萬里市)、長崎縣三市(松浦市、佐世保市、平戶市)及福岡縣二市(壹岐市、絲島市)，依據 2016 年 4 月戶政統計資料，人口總數為 25 萬 4700 人。日本相較於我國訂定之緊急應變計畫區及做法，PAZ 的操作概念類似我國 0~3 公里預防性疏散範圍，UPZ 的操作概念則與我國 EPZ 3~8 公里及 8~16 公里之防護準備區域。為利各國觀摩人員瞭解本次演習規劃，演習前一日日方安排於佐賀市辦理演習前說明會，由內閣府及原子力規制委員會(NRA)說明日本核子事故緊急應變規劃與做法、本次演習觀摩路線及演練項目等。

本次演習假想九州外海發生芮氏規模 7.0 地震，造成玄海核能電廠四號機爐心冷卻水破管，儘管緊急爐心冷卻系統(ECCS)及時動作，仍無法有效將冷卻水注入反應爐，最後爐心熔毀，放射性物質外釋到核能電廠外，造成全面緊急事故。在樣的情境設定下，檢視緊急應變人員及民眾面對核子事故應變作為是否足夠。

一、9月2日核安演習觀摩前說明會(佐賀)

為利國際觀摩人員瞭解日本核子事故緊急應變機制有初步瞭解，日方於正式演練前辦理觀摩前說明會(如圖 1)，由內閣府及原子力規制委員會(NRA)介紹日本核子事故緊急應變導覽(Guidelines for the Nuclear Disaster Management in Japan)、日本玄海區域緊急應變簡介(Emergency Response in the Genkai Region)、2016 年日本核安演習影片介紹(Highlight of 2016 Nuclear Energy Disaster Prevention Drill -Video)、2017 年日本核安演習行程介紹(Schedule for the 2017 Nuclear Energy Disaster Prevention Drill)。

原子力規制委員會係自日本福島核子事故以後，日本為強化核安監管的獨立性，於 2012 年 9 月成立之獨立機關，並將原分散至各省局處之核能安全、核子保安及核子保防等業務轉移至原子力規制委員會下監管，其角色與我國行政院原子能委員會相當。

日本核子事故緊急應變區分為廠外緊急應變及廠內緊急應變，廠內緊急應變之主導機關為原子力規制委員會，廠外則是內閣府(Cabinet Office)下之核子事故緊急應變及整備委員會(Nuclear Emergency Preparedness Commission, NEPC)，於我國則全是由行政原子能委員會主導。為檢視核子事故緊急應變能力，日本核安演習規劃為每年擇 1 座核能電廠辦理，至於核能電廠廠內演練部分，則為每座核能電廠每年至少辦理 1 次之廠內演練，此做法與我國相同。



圖 1 觀摩前說明會

二、9月3日核安演習觀摩(佐賀、長崎)

本次演習以事故時序進行，當天上午開始模擬玄海核能電廠發生事故，依情境設定進入核子事故時間點，7時30分達緊急戒備事故，11時進入廠區緊急事故，15時達全面緊急事故。本次觀摩主要係依情境時間，讓觀摩人員瞭解日本核安演習之實人、實地、實物之實境演練作為，按日方安排，本次主要係觀摩廠外緊急應變作業。

觀摩第一站即是在緊急戒備事故階段，由九州電力公司依據 Genkai Region Council for Nuclear Emergency Preparedness 針對 PAZ 內部分弱勢民眾(如行動不便、乘坐輪椅等民眾)進行預防性疏散至計畫指定之社福機構(如圖 2)，按電廠工作人員說明，玄海核能電廠於事故時會依計畫指派約 40 名員工辦理 PAZ 區域內部分弱勢民眾預防性疏散作業。

第二站則安排參訪玄海核能電廠廠內演練，本次僅安排觀摩廠內緊急應變中心之通報及聯繫演練，並參訪核子事故時用於提供冷卻水注入圍阻體所需之緊急電源設備。

第三站前往距離玄海核能電廠 2 公里遠之玄海園老人安養中心(如圖 3)，此時已進入廠區緊急事故，依日本政府的計畫，係針對 PAZ 內執行預防性疏散作業。當核子事故發生時，會針對安養中心的民眾進行預防性疏散，若有無法移動之住民，且疏散風險更高時，則採室內掩蔽方式。為確保安養中心內於事故期間具備基礎維生設施及避免輻射污染，除設有緊急柴油發電機(油料 4000 公升，可提供 3 日發電量)、雙重密閉門外，亦設有空氣過濾設備並維持正壓。空氣過濾設備由政府出資建置，民間經營，地方政府維護，可有效去除放射性碘及放射性銫。

第四站則前往距離核能電廠東南方 12 公里遠之核子事故後勤支援基地(Nuclear Accident Logistics Support Base) (如圖 4)，該基地的功能包含蒐集來自九州電力總公司所提供之訊息、提供事故期間進入事故電廠或受影響區域之最新規定、進出管制、進入影響區域前之輻射管制規定告知、輻射防護教育及備援設備停放之中繼站等，該中心設有急救站、防護裝備著裝區、緊急通訊車、移動通訊車、緊急發電機及全身計測區等。

第五站來到了距離核能電廠 13 公里遠的唐津市災害對策本部(相當於我國地方災害應變中心)(如圖 5)，該中心於玄海核能電廠發生緊急戒備事故時即成立開始應變，參訪時，情境已進入全面緊急事故，此時唐津市已著手進行民眾防護行動；唐津市災害對策本部於緊急戒備事故時即成立，開始就預防性疏散作業進行準備，當事故惡化至廠區緊急事故時，該部開始針對劃定為 PAZ 範圍內之民眾進行預防性疏散作業，同時為未來全面緊急事故時所需採取之民眾防護行動進行準備並持續蒐集電廠的事故機組狀況。在參訪過程中，可發現九州核能電廠派員進駐該唐津市災害對策本部，向指揮官及各進駐成員解說事故機組狀況(此與我國做法相同，當核子事故發生時，台電公司即派員赴地方災害應變中心)。該對策本部另一項重要的任務，即是針對轄內民眾發布警報，方式包含收音機、網路公告、廣播、傳真機、電子郵件等多元管道。其中電子

郵件部分，係平時民眾若有辦理登錄申請，事故時將會收到事故相關訊息。

第六站來到了距離核能電廠東南方 13 公里遠之玄海廠外應變中心(Genkai Offsite Center)(如圖 6)，由內閣府伊藤副大臣擔任指揮官，各鄰近町、市均派員進駐，該中心內設有行政組(Administrative Team)、公共關係組(Public Relations Team)、支援組(Operation Support Team)、醫療組(Medical Team)、輻射監測組(Radiation Team)、電廠組(Plant Team)、現場應變組(Field Response Team)以及居民安全組(Resident Safety Team)。其操作概念類似我國核子事故中央災害應變中心前進協調所，惟其進駐成員及分工更為複雜；當日本核子事故發生時，由位於東京都之中央災害對策本部(Nuclear Emergency Disaster Management Headquarters)決定哪些區域要執行民眾防護行動，地區災害對策本部(Local Nuclear Emergency Response Headquarters)依照中央下達的命令，訂定執行策略後，依據核能電廠事故狀況，分階段進行對應之民眾防護行動，此操作概念亦與我國相同。



圖 2 核電業者協助執行 PAZ 內民眾預防性疏散



圖 3 玄海園老人安養中心輻射防護設施與物資儲存展示及民眾預防性疏散



圖 4 九州電力公司核子事故後勤支援基地



圖 5 唐津市災害對策本部應變



圖 6 玄海町廠外應變中心應變

三、9月4日核安演習觀摩(佐賀)

因玄海核能電廠鄰近區域有很多離島，爰日方安排觀摩離島疏散作業。第二天第一站來到了高島(Takashima Island)觀摩離島民眾疏散作業，高島位於玄海核能電廠西南方 11 公里處，島上居民有 2143 人，與佐賀縣唐津市有跨海大橋相連，因此高島的民眾疏散作業仍以車輛疏散為主，至於其他較遠的小島，依日本規劃，將利用船運方式撤離至中繼站後，改以車輛方式疏散，若民眾有自家車亦可自行駛離至收容所。依據演習情境，上午 8 時 35 分時，唐津市政府已透過收音機、警訊通知(即災害告警細胞廣播服務，CBS，訊息內容翻譯請參考附件一)(如圖 7)等管道傳達電廠放射性物質外釋，需進行疏散訊息，高島民眾於集結點(高島運動文化交流中心，Takashima Sports and Culture Exchange Center)，經過政府人員點名完成後搭上疏散車輛，於 8 時 40 分時出發前往 30 公里外之收容所。

第二站日方安排觀摩高島之輻射防護設施(位於島上的老人安養中心)，日本政府因玄海核能電廠鄰近區域有許多離島，經歷日本福島核災後，鑒於多數年長者或弱勢族群因不當疏散而往生，日本政府於玄海核能電廠鄰近島嶼均補助經費安裝輻射防護設施。該老人安養中心之輻射防護設備規格與第一天參訪之玄海園老人安養中心相同。

第三站來到了位於玄海核能電廠南方約 5 公里遠的玄海學園(Genkai Mirai Gakuen)觀摩學生疏散作業(如圖 8)。當唐津市災害對策本部於上午 11 時傳達疏散命令時，學生將由學校安排疏散至收容所。疏散操作模式與我國類似，由老師將學生集結後，陸續搭上疏散車輛離開。

第四站到達玄海町町民會館(GenKai town hall)，依情境目前核能電廠放射性物質已外釋，因此必須針對居住於 UPZ 內民眾採行暫時移居(temporarily relocate)策略。會館中無自家車民眾將集結於會館大廳(如圖 9)，經由政府人民發送碘片及口罩後，搭乘車輛疏散至 30 公里外之收容所(與學生疏散收容所位置相同)。

第五站到達位於核能電廠東南方 34 公里之多久市(Taku city)運動場，該運動場為疏散民眾及車輛輻射污染偵檢區域之一，其操作概念與我國防護站相似。當玄海町民眾疏散時，會先經過擇定的偵檢區域，若車輛經過門框偵檢器後無輻射異常警報，則該車輛可直接駛往收容所，反之則先請疏散民眾下車，接續進行人車分離之輻射偵檢與除污作業(如圖 10)。除污作業係由日本自衛隊辦理，日本自衛隊類似我國國軍支援中心的角色。

最後來到了唐津市政府會議室，就演習兩天觀摩的心得進行意見交流，因觀摩人員眾多，主辦單位將觀摩人員區分為兩組，我國觀摩人員兩位均分配於第二組，就日本緊急應變機制及民眾防護行動策略等議題進行分組討論。其中我國就教日方有關核子事故發生時，需要多少疏散的時間才是合理的部分，日方回應因每座核能電廠的情境不同，有關疏散時間模擬除了依照美國提出之模擬程式進計算，也會因每座核能電廠之地理環境、人口分布情形會有不同的結果，因此尚無法回應多少疏散時間才是合理的，惟日方會將問題攜回研討。

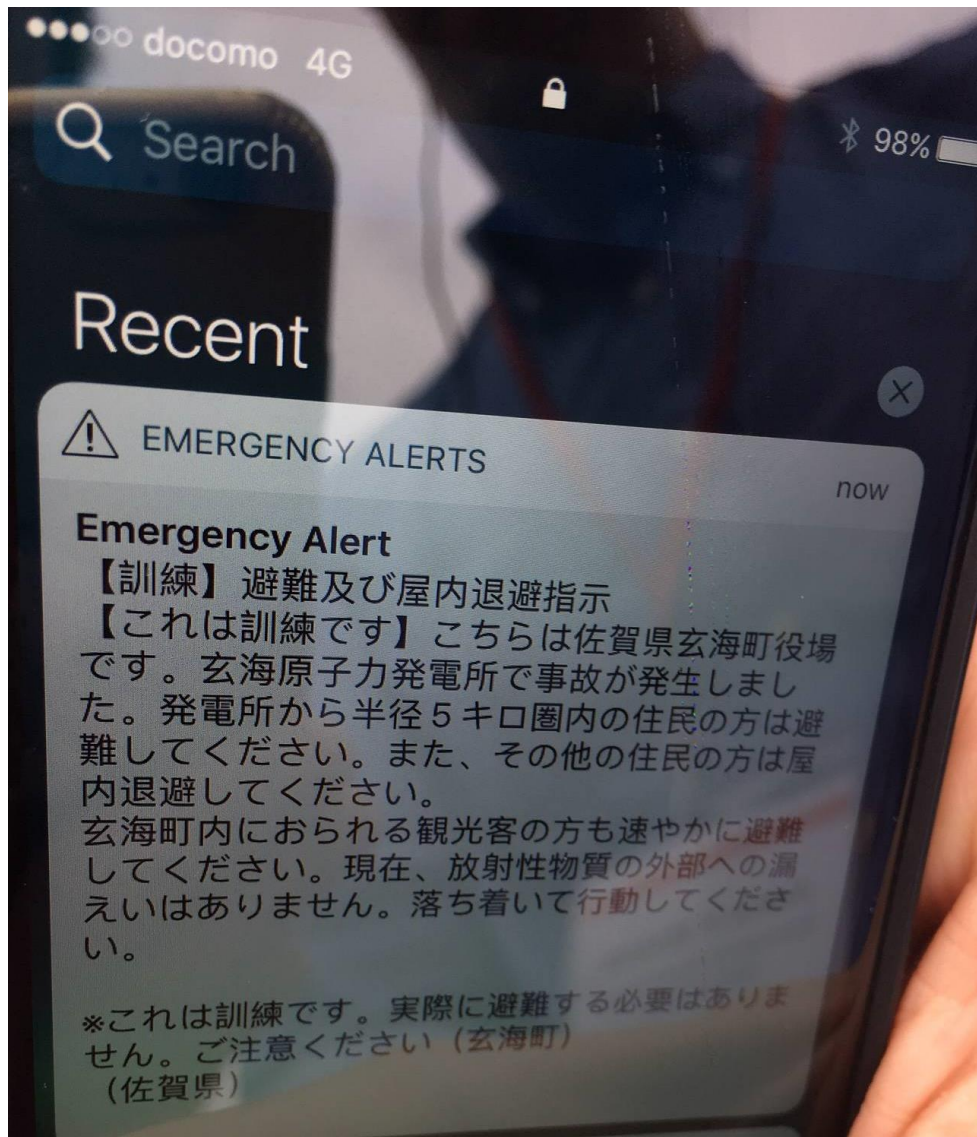


圖 7 玄海町警訊通知



圖 8 玄海學園學生疏散



圖 9 UPZ 內玄海町警訊通知及民眾集結



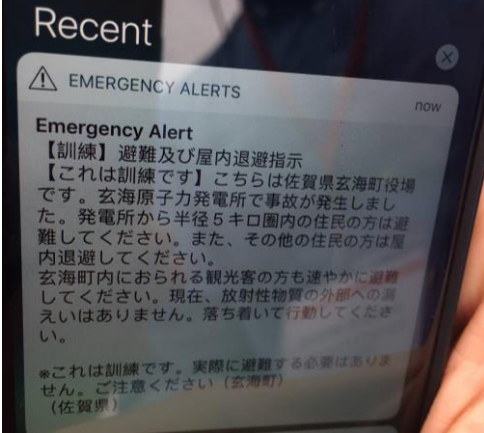
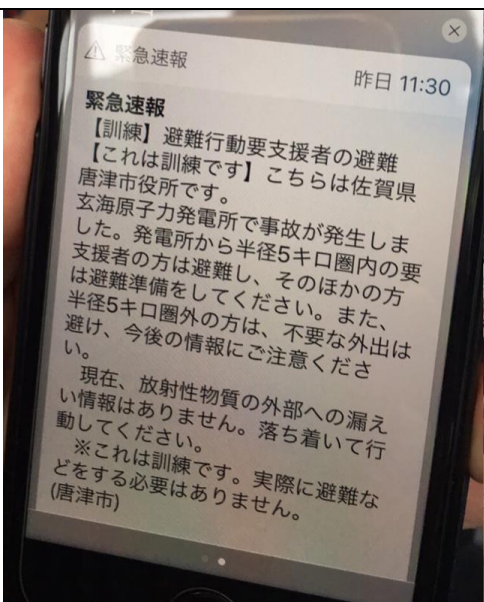
圖 10 多久市運動場人車偵檢與除污

肆、心得與建議

- 一、日方本次演習演練重點在於當事故惡化至全面緊急事故，且放射性物質外釋後之各項計畫的驗證，與我國核安演習規劃稍有不同。我國自 2011 日本核災發生後，核子事故緊急應變機制已大幅改善與進步，同時已要求台電公司為避免放射性物質大量外釋，必要時得採行廢棄核子反應器設施應變措施，以確保民眾生命財產安全為第一優先，因此我國核安演習實兵演練項目包括驗證緊急戒備事故至廠區緊急事故時之應變程序。透過赴日觀摩日方年度核安演習，對於我國未來核安演習規劃之廣度必有益處。
- 二、日本政府對於疏散風險高的弱勢族群先採行室內掩蔽方式，可避免類似日本福島核災時，部分年長者因不當疏散造成往生的情形。我國因採行預防性疏散，爰於廠區緊急事故時，即採行預防性疏散至相對應的社福機構，亦可避免類似情形發生。
- 三、日本核能電廠業者負責 PAZ 內部分民眾之預防性疏散作業，此作法可加深民眾對於業者肯負責任之態度，值得我國效法。目前我國核子事故緊急應變法修法，已規劃加重業者平時整備作業之責任，有關平時宣導、協助疏散等作業亦可納入業者緊急應變計畫中。
- 四、本次演習係安排週末辦理，所動員之學生、民眾皆採自願性參加，其中不乏年輕族群參加，我國 2017 年核安第 23 號演習亦已參考日本做法，首次橫跨週六辦理，未來可視辦理成效將週末辦理核安演習規劃納入考量，以提升民眾參與核安演習的機會。

伍、附件

附件一、日本核安演習警訊通知內容翻譯

	<p>【演練】避難及室内掩蔽指示 【這是演練】這裡是佐賀縣玄海町公所，玄海核能電廠已發生事故，請距離核能電廠半徑 5 公里的居民實施避難；其他居民則實施室內掩蔽。玄海町內的觀光客也請儘速實施避難。目前放射性物質尚未外釋，請大家冷靜採取行動。 ※請注意，這只是演練，無須實施避難(玄海町) (佐賀縣)</p>
	<p>【演練】避難行動弱勢者の避難 【這是演練】這裡是佐賀縣唐津市公所。玄海核能電廠已發生事故，距離電廠半徑 5 公里的弱勢者請實施避難；其他居民請進行避難準備。另外，半徑 5 公里外的居民請盡量避免外出並留意今後的情報。目前放射性物質尚未外釋，請冷靜採取行動。 ※請注意，這只是演練，無須實施避難等行動。 (唐津市)</p>

Nuclear Energy Disaster Prevention Drill in Japan

- In order to verify our response system to nuclear emergency situation, drills based on the *Act on Special Measures Concerning Nuclear Emergency Preparedness* are conducted based on the "Emergency Response" policies created in regions where the government, local governments and nuclear operators jointly conduct exercises to learn lessons from the exercise results and improve the "Emergency Response" policies.

[Background and Purpose]

(Disaster prevention drill based on the Article 13, Paragraph 1 of the *Act on Special Measures Concerning Nuclear Emergency Preparedness*)

- [1] To check the effectiveness of the disaster preparedness and response system of the government, local governments, and nuclear operators
- [2] To check the national and local government systems and procedures defined in manuals for a nuclear emergency situation
- [3] To verify the evacuation plan based on the "Emergency Response" policies of region
- [4] To extract lessons from the exercise results and improve the emergency response
- [5] To enhance the skill of the staff involved in nuclear disaster measures

[Participating Institutions]

Government institutions, local governments, nuclear operators, specified public institutions, etc.

[Drill Contents]

- (1) Quick setup of the initial response system
- (2) Decision-making on the emergency response plan and other items through collaboration among national and local organizations
- (3) Exercises in the emergency protective actions of residents, etc.

Nuclear Energy Disaster Prevention Drills

Carried out in the past

(After the Fukushima accident)

- [Oct, 2013]
Kyushu Electric Power Co., Inc.
Sendai Nuclear Power Station
- [Nov, 2014]
Hokuriku Electric Power Company
Shika Nuclear Power Station
- [Nov, 2015]
Shikoku Electric Power Co., Inc.
Ikata Nuclear Power Station
- [Nov, 2016, Feb, 2017]
Hokkaido Electric Power Co., Inc.
Tomari Nuclear Power Station

(Purpose of Drills)

To check procedures based on the Nuclear Emergency Response Guidelines, etc.

To verify emergency response, etc.

Nuclear Energy Disaster Prevention Drill in 2017

- [Timing] September, 2017
[Target Nuclear Power Site]
Kyushu Electric Power Co., Inc.
Genkai Nuclear Power Station

Overview of the 2017 Nuclear Energy Disaster Prevention Drill

1 Background and Purpose

[Disaster prevention drill based on the Article 13, Paragraph 1 of the *Act on Special Measures Concerning Nuclear Emergency Preparedness*]

- [1] To check the effectiveness of the disaster preparedness and response system of the government, local governments and nuclear operators
- [2] To check the national and local government systems and procedures defined in manuals for a nuclear emergency situation
- [3] To verify the evacuation plan based on the "Emergency Response in Genkai region"
- [4] To extract lessons from the exercise results and improve the emergency response
- [5] To enhance the skill of staff involved in nuclear disaster measures

2 Drill implementation Timing

September 3rd to 4th, 2017

3 Target Nuclear Site in the Drill

Kyushu Electric Power Co., Inc. Genkai Nuclear Power Station

4 Participating Institutions, Organizations

Governmental Institutions: Cabinet Secretariat, Cabinet Office, Nuclear Regulation Authority, and other relevant ministries and agencies

Local Governments: Saga, Nagasaki, Fukuoka prefectures, Genkai Town, cities of Karatsu, Imari, Matsuura, Sasebo, Hirado, Iki, Itoshima, and other cities and towns involved

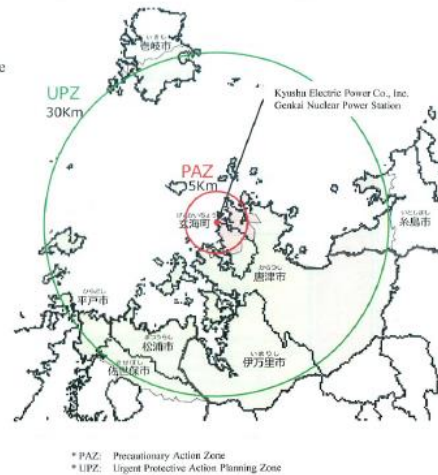
Operator: Kyushu Electric Power Co., Inc.

Agencies involved: National Institutes for Quantum and Radiological Science and Technology National Institute of Radiological Sciences, Japan Atomic Energy Agency, etc.

5 Drill Contents

The following exercises are conducted by assuming complex disasters combined with an earthquake.

- (1) Quick establishment of the initial response system
- (2) Decision-making on the emergency response plan and other times through collaboration among national and local organizations
- (3) Exercises in emergency protective actions of residents, etc.



* PAZ: Preliminary Action Zone
* UPZ: Urgent Protective Action Planning Zone

Scenario for the 2017 Nuclear Energy Disaster Prevention Drill

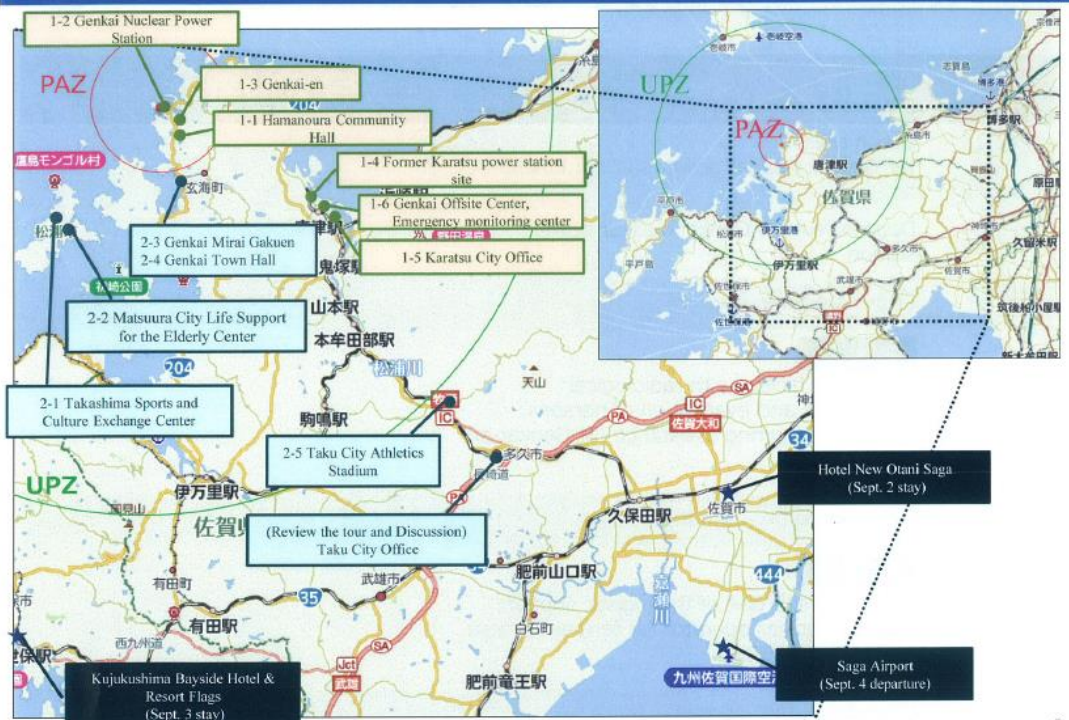


- During constant operation of Unit 4 at the rated thermal output, at the Genkai Nuclear Power Station of Kyushu Electric Power Company, an earthquake occurred in the northern part of Saga Prefecture.
- Because of the reactor coolant leakage that followed, the reactor was manually shut down after emergency load down. Though the emergency core cooling system started running after the shutdown, the system became unable to pour water due to facility failures, resulting in a state of general emergency.
- The situation worsened further and the core was damaged releasing radioactive materials that affected the region surrounding the power station.

Exercises in the 2017 Nuclear Energy Disaster Prevention Drill

		Day 1	Day 2
AM	Operator Exercise (Activities to remedy the situation)	Alert Event Occurred because of Earthquake Outbreak	<p style="text-align: center;">Response to the General Emergency (Evacuation of residents in response to the general emergency)</p> <p><Functional Exercises [1] ></p> <ul style="list-style-type: none"> • Evacuation of residents in PAZ • Sheltering of residents in UPZ <p><Functional Exercises [2] ></p> <ul style="list-style-type: none"> • Emergency radiation monitoring • Temporary relocation of residents in UPZ
		<p style="text-align: center;">Response to the Alert Event (Quick setup of the initial system)</p>	
Site-area Emergency			
<p style="text-align: center;">Response to the Site-Area Emergency (Decision-making on the evacuation plan through collaboration among national and local organizations)</p> <ul style="list-style-type: none"> ○ Conference of the Nuclear Accident Response Headquarters ○ Operating exercise of the Joint conference of the Major Disaster Management Headquarters and the Joint Nuclear Accident Response Headquarters in response to a complex disaster ○ Evacuation exercise for residents requiring assistance in the PAZ 			
PM	Operator Exercise (Activities to remedy the situation)	General Emergency	
		<p style="text-align: center;">Response to the General Emergency (Decision making on the evacuation plan through collaboration among national and local organizations)</p> <ul style="list-style-type: none"> ○ Reporting and awaiting a decision on the outbreak of an event falling under Article 15 ○ Declaration of a nuclear emergency situation ○ Operating exercise of the Joint conference of the Nuclear Emergency Response Headquarters and the Major Disaster Management Headquarters 	

Visit sites for 2 days tour

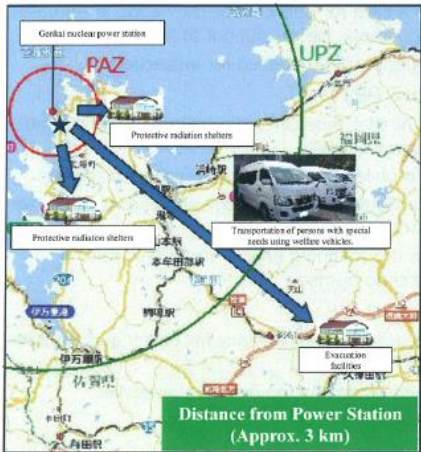


Visit 1 Exercise for supporting evacuation of residents requiring assistance in PAZ by Kyushu Electric company.(at Hamanoura community hall)

Date and time of visit: Sep. 3 (Sun.) 9:50 – 10:10 (Duration: 20 min)

Background and overview

- ◇ In regard to the regional disaster preparedness and response plan, evacuation plan etc. concerning nuclear disaster management drawn up by the Municipality, "Regional Council for Nuclear Emergency Preparedness" established as a working group for resolution of issues at local communities in which nuclear power stations are located will support the embodiment and strengthening of these plans.
- ◇ In response to the request of "Genkai Region Council for Nuclear Emergency Preparedness", the nuclear operator, Kyushu Electric Power Company will provide 21 welfare vehicles for the purpose of supporting the evacuation of residents requiring assistance in PAZ such as bedridden persons, persons unable to walk, etc. In case of a nuclear disaster, the employee of that company will drive and operate the welfare vehicles, in order to transport residents requiring assistance to predetermined sheltering facilities with radiological protections.
- ◇ At Hamanoura Community Hall tour will be made of the status of support of residents requiring assistance using welfare vehicles provided by Kyushu Electric Power Company (transportation of walking difficulty persons to Welfare vehicles).



Transportation exercise for bedridden persons using vehicles provided with stretchers.



Transportation exercise for residents with walking difficulty, using wheelchair accessible vehicles.



Date and time of visit: Sep. 3 (Sun.) 10:20 – 12:10 (Duration: 1 hour 50 min)

Background and overview

- ◇ Genkai nuclear power station Exercises on operation of task force at emergency response center as well as notifying and communicating information.
- ◇ Exercise on restoration from accident (Implementation of natural convection cooling of containment using mobile large capacity fire engine.)

Time	Schedule	Outline of exercise
10:45	Observation of Emergency task force operation exercise at emergency response center etc. (include observation of TV conference)	Emergency task force which is established at emergency response center directs the emergency action, while carrying out continuous sharing of information with the task force at company headquarter by means of videoconference system etc. In addition, carry out communicating activity for the involved agencies within and outside the company.
11:35	Observation of exercise on restoration from accident, utilizing equipment countermeasures against severe accidents etc.	Provide mobile large capacity fire engine for providing natural convection cooling in the containment vessel, as well as carry out laying of hoses. (Partly simulation)



Exercises on operation of task force and carrying out of informing and communicating.



Exercises on restoration from accident.

Notes for observing Genkai Nuclear Power Station

1 Change to bus provided by Kyushu Electric Power Company at Energy Park parking lot

- To the extent possible leave hand baggage in the tour bus (In order to smoothly finish baggage tour described as follows in 2)
- Be sure to carry your ID (Passport etc., no copies) for which a copy was submitted beforehand. (This will be used in the subsequently described entry procedures in following item 2.)

2 Entering procedures to restricted areas (No.1 PP) at guard post at main gate

- Get off the bus, walk to guard post at main gate and carry out entering procedures.
- The participants are divided into 3 groups by Kyushu Electric Power Company, indicate your ID at reception. Confirmation is made with the copy submitted beforehand.
- When confirmation is made, we will hand over a badge to you and a card for entry. Place the badge at an easily visible part such as the chest and keep the card hanging around your neck. Be careful not to lose it.
- After the entry procedures, return to bus. If you have hand baggage, it will be opened for inspection.

3 Entry procedures to environmental protected areas (No.2 PP)

- Get off the bus, walk to No.2 building and go through procedures. At that time carry the badge and card handed over to you at above 2. These will be necessary in order to enter into No.2 PP.
- Original IDs are not necessary. (It should be noted that bringing in mobile phones and cameras is prohibited)
- The participants are divided into 3 groups by Kyushu Electric Power Company, your badge and card handed over to you will be confirmed. If you have hand baggage, it will be opened for inspection.
- After passing through the portal metal detector, place your card on the scanning unit of the access control device and enter your code number. Our attendant will tell you the code number.

4 When exiting the area

- Exit from the area by placing your card on the scanning unit of the access control device for building of No.2 PP. Entering the code number is unnecessary
- Before getting off the bus, our guard staff will collect the badges and cards handed over to you earlier.

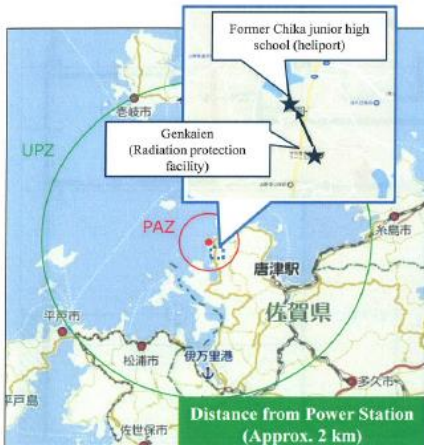
Visit 3

Sheltering facility with radiological protections and evacuation of residents requiring assistance (at Genkai-en etc.)

Date and time of visit: Sep. 3 (Sun.) 12:55 – 13:45 (Duration: 50 min)

Background and overview

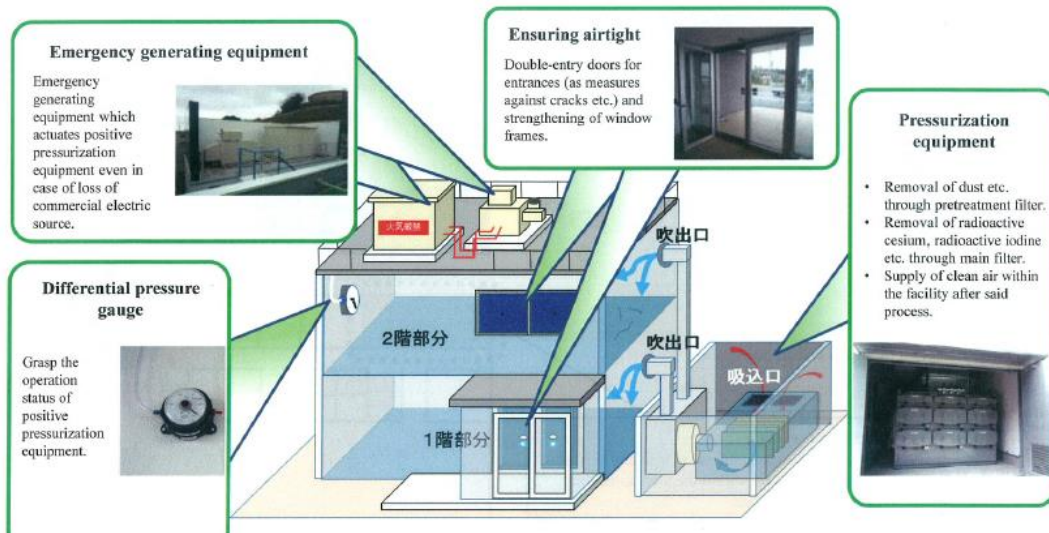
- ◇ The facility was provided to accommodate residents requiring assistance in the relevant areas facing higher health risks due to evacuation activities. It was based on a request from the government concerning evacuation of residents requiring assistance within PAZ.
- ◇ Observation of this facility, besides equipment concerning sheltering facilities with radiological protections such as those for positive pressure management within the facility will also include status of stockpiles of radiation protection equipment and materials and everyday commodities (food etc.), as well as the evacuation exercise for hosted evacuees who are able to evacuate on their own.



Time	Schedule	Outline of exercise
12:55	Observation of sheltering facilities with radiological protections	Observe the sheltering facilities with radiological protections whose purpose is to accommodate residents and others facing higher health risks due to a forced evacuation.
13:20	Start of evacuation of residents requiring assistance	Observe activities showing how hosted evacuees who are able to evacuate, board the welfare vehicles with assistance from supporters and start evacuation.
Transportation to former Chika Junior High School (heliport) by bus		
13:30	Boarding of residents requiring assistance into helicopter	Observe activities showing how residents requiring assistance who have started to evacuate, board the helicopters provided to alleviate the load on these persons, and then depart to the evacuation destination.

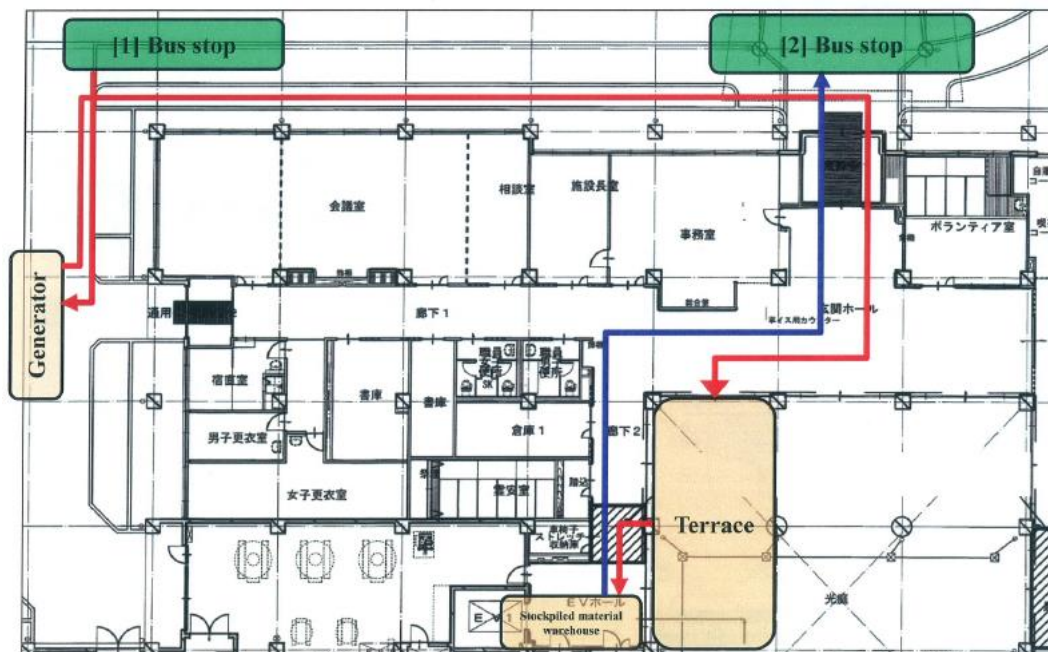
(Reference) Main characteristics of sheltering facilities with radiological protections

Although radiation protection measures concerning sheltering in place for residents requiring assistance and residents as well as emergency off-site center etc. differs depending upon the form, scale and other features of a facility, the principal points of radiation protection measures are as follows.



Visit 3 Sheltering facilities with radiological protections and evacuation of residents requiring assistance (Genkai-en)

Route within the facility to be observed (Genkai-en)



Visit 4 Operating exercise of the logistic support base of Nuclear operator (at former Karatsu power station site)

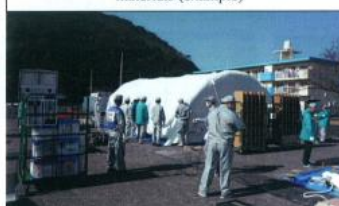
Date and time of visit: Sep. 3 (Sun.) 14:10 – 14:35 (Duration: 25 min)

Background and overview

- ◇ Observation of activities including setting up of air tents for placement of equipment and materials within the tent among other activities for establishing the disaster control support center. In order to fulfill the functions of the disaster control support center, this exercise sets up an activity area (air tents) based on the roles of each functional group, and installs equipment and materials within the tent.
- ◇ Observation of communication environment that was setup among other exercises for establishing the disaster control support center. Observe the site for utilizing communication environment equipment for the purpose of sharing information between the disaster control support center and response headquarters of the head office through videoconference and other means.



Setting up tent and placement of equipment and materials (example)



Setting up communication environment (example)

Visit 5 Exercise at Karatsu City Disaster Management Headquarters

Date and time of visit: Sep. 3 (Sun.) 14:45 – 15:15 (Duration: 30 min)

Background and Overview

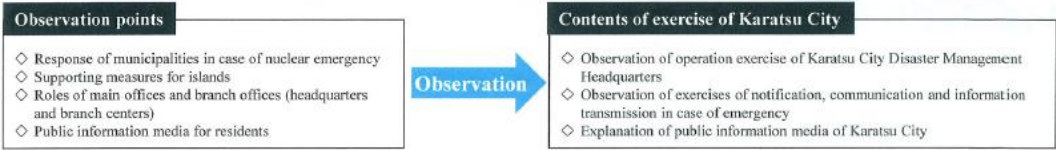
- ◇ Upon outbreak of alert event, Karatsu City will establish disaster alert headquarters in Karatsu City Office, as well as establish disaster response branches at each city center in charge of PAZ. This is intended to boost system response capability when an event develops through sharing of information among these disaster facilities.
- ◇ Upon outbreak of Site-Area Emergency, Karatsu City Disaster Management Headquarters starts evacuation of residents requiring assistance in PAZ within the city. At the same time, the headquarters directs the preparation of protective action faced on general emergency and conduct the collection and management of relevant information.

In this occasion, the status of exercise activities for that time point will be observed.

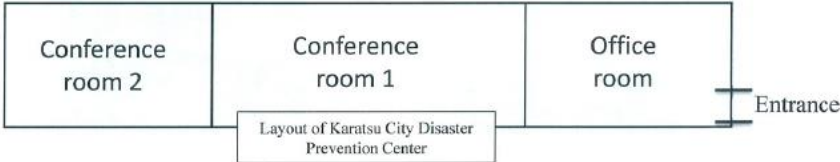
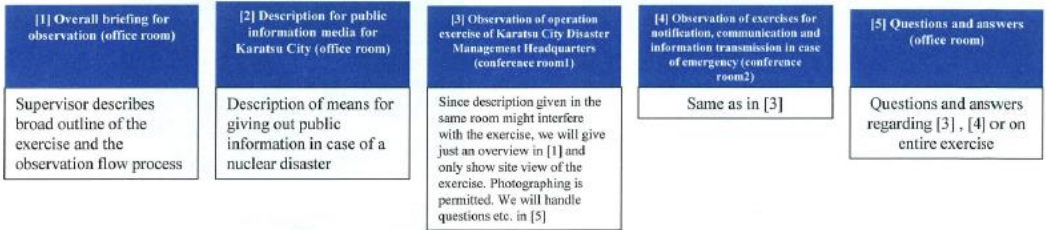


Visit 5 Exercise at Karatsu City Disaster Management Headquarters

Date and time of visit: Sep. 3 (Sun.) 14:45 – 15:15 (Duration: 30 min)



Schedule of corresponding observation by Karatsu City



Visit 5 Exercise at Karatsu City Disaster Management Headquarters

Points of guidance

- ◇ Explanation of public information media at Karatsu City (office room)
 - Public information media at Karatsu City
 - Disaster response administration radio, city home page, administrative broadcasting, L-ticker (telop), registration system disaster information e-mail, interrupting broadcasting into community FM, etc.
 - On sharing of information within Karatsu City Hall
 - We will explain the actual state of disaster response of Karatsu City, showing the disaster response list sheet (Disaster response chronology)



Karatsu City disaster management radio communication network
(Broadcast-based communication system and/or mobile communication system) console



Karatsu City disaster management information interfacing system
(Multiple public communication media can be actuated simultaneously from a single terminal)



Visit 5 Exercise at Karatsu City Disaster Management Headquarters

Points of guidance

- ◇ Observation of exercises for setting up and managing the Karatsu City Disaster Management Headquarters (conference room 1)
Agenda at the observation: "Strengthening of organization for general emergency and evaluating means for support of islands."
- ◇ Observation of exercises of notification, communication and information transmission in case of emergency (conference room 2)
Agenda at the observation: "Confirmation of SE (Site Area Emergency) evacuation situation and collection of information on disaster situation within the jurisdictional area and sharing of information within city office."



Exercises on establishment and management of Karatsu City Disaster Management Headquarters
(2016 Saga prefecture nuclear disaster management exercise)



Exercises of notification, communication and information transmission in case of emergency
(2016 Saga prefecture nuclear disaster management exercise)



Visit 6 Genkai Offsite Center, Emergency monitoring center

Date and time of visit: Sep. 3 (Sun.) 15:25 – 16:45 (Duration: 80 min)

Background and overview

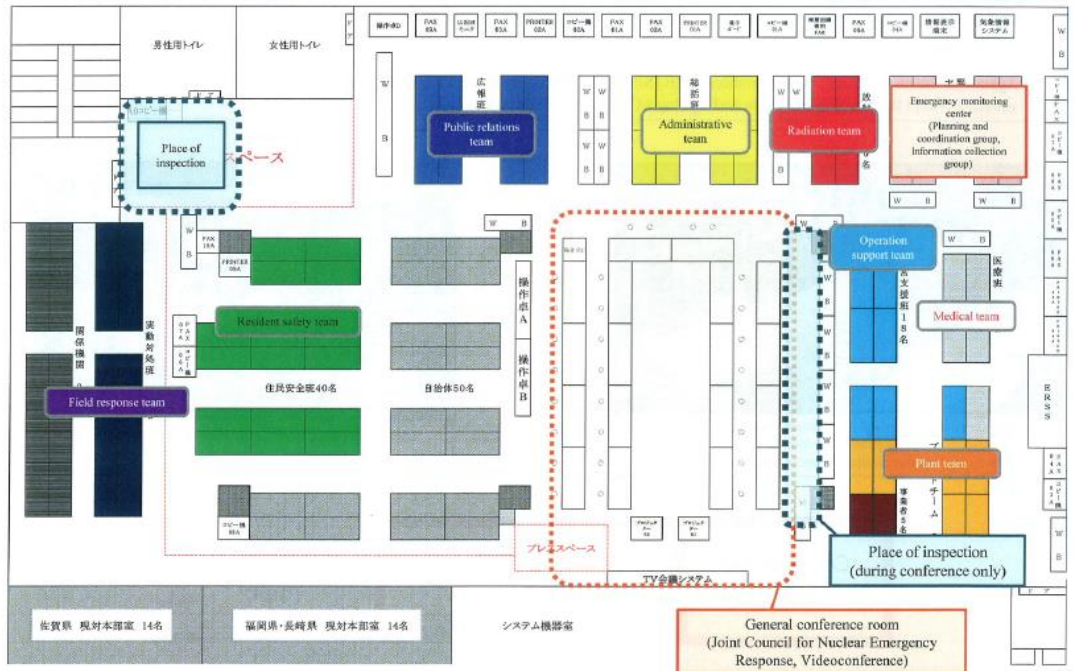
- ◇ Upon the outbreak of Site-Area Emergency, the Nuclear Accident Joint Response Headquarters of the Nuclear Regulation Authority and Cabinet office will be established. In case that the situation develops to general emergency hereafter, in addition to establishment of local nuclear emergency response headquarters, a Joint Council for Nuclear Emergency Response consisting of Hokkaido and relevant municipalities will be held for the purpose of sharing the necessary information and implementing emergency actions. These exercise activities will be observed. (Activities will be carried out mainly at 2nd floor of Genkai Offsite Center.)
- ◇ Upon the outbreak of a Site-Area Emergency, an emergency monitoring center shall be established within Genkai Offsite Center for the purpose of collecting and managing of information and other items concerning emergency monitoring. These exercise activities will be observed.



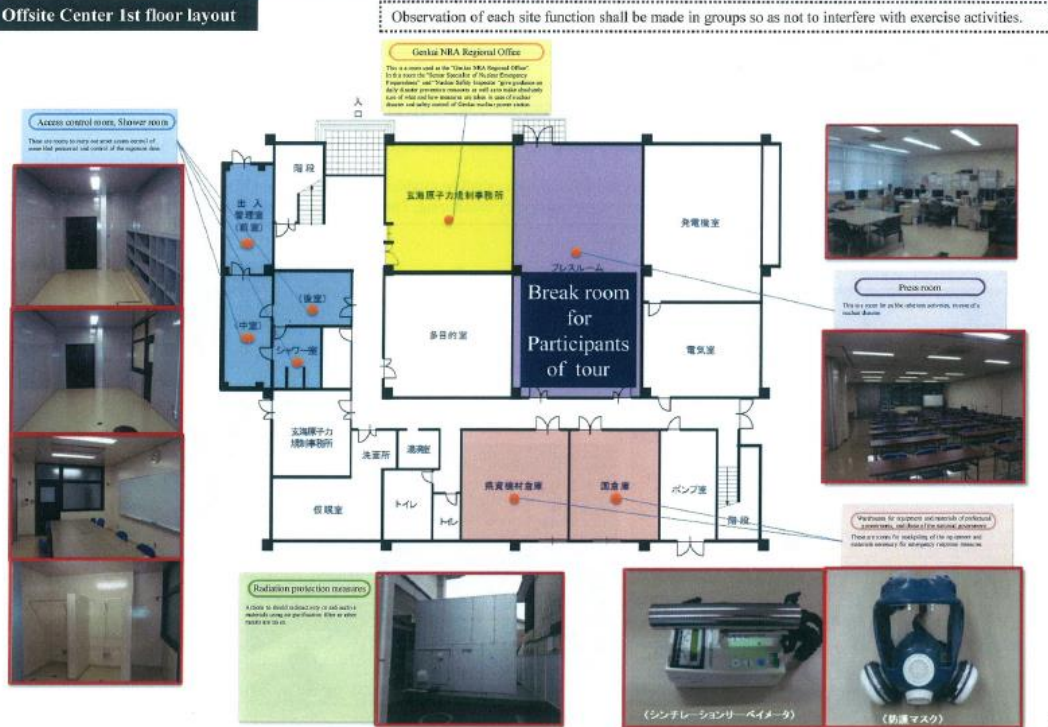
Visit 6 Genkai Offsite Center, Emergency monitoring center

Offsite Center 2nd floor layout

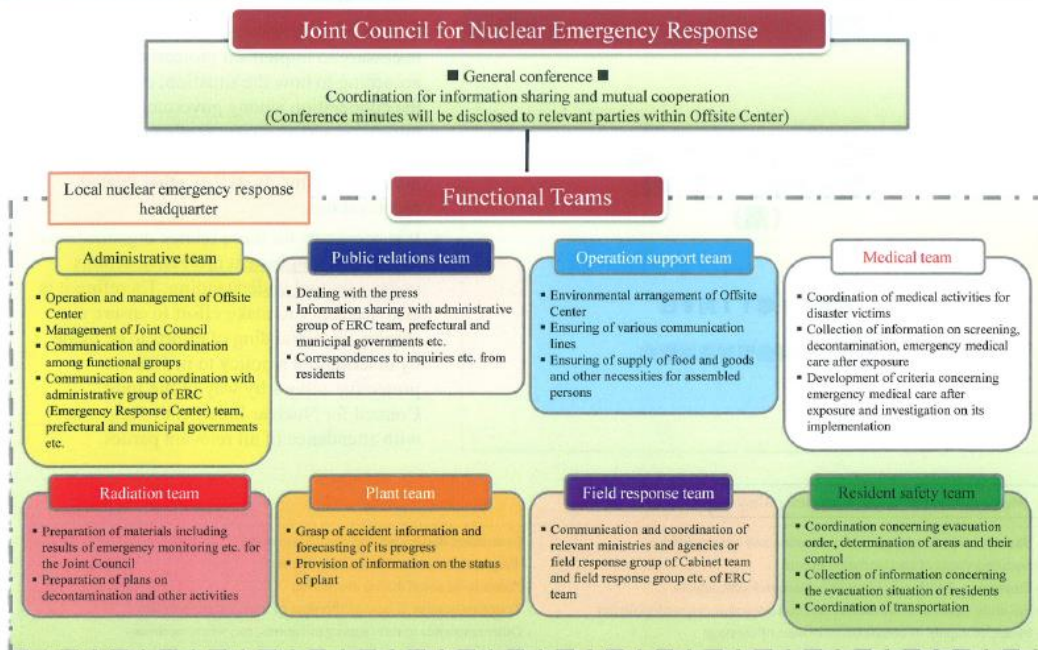
Observation of each site function shall be made in groups so as not to interfere with exercise activities.

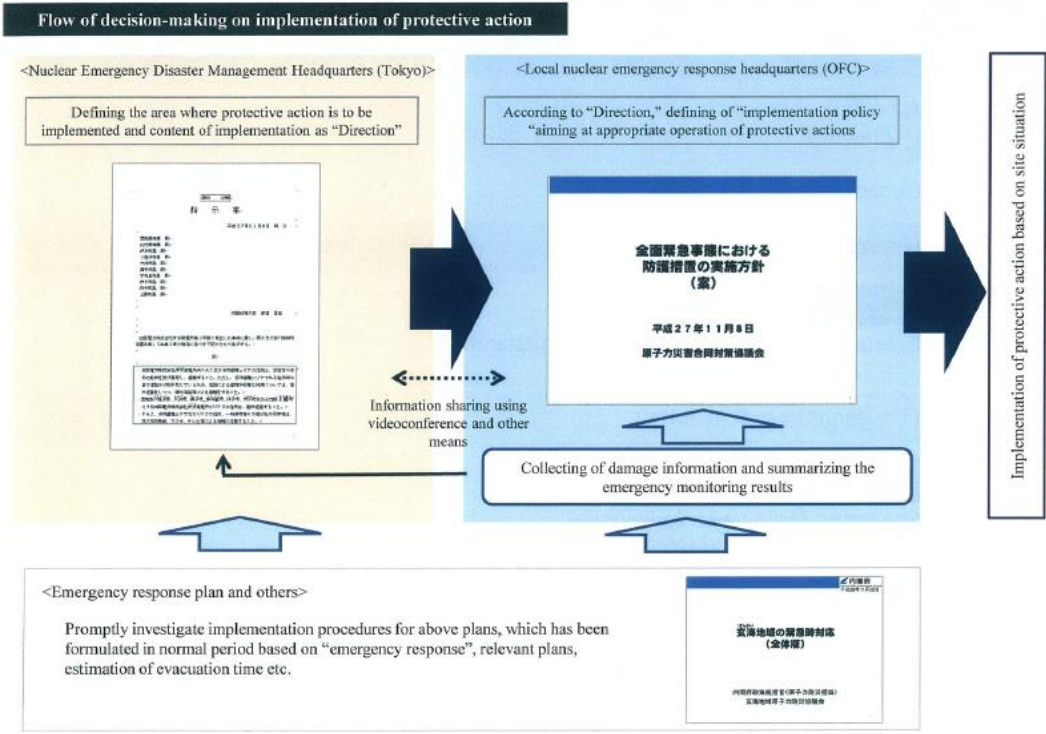


Offsite Center 1st floor layout



Role of each functional group in Offsite Center





Emergency implementation policy of Protective action facing general emergency

- In case of nuclear disaster, it will be necessary to implement protective actions, according to how the situation, develops with the cooperation among government ministries and agencies, prefectural governments, relevant municipalities, the nuclear operator, as well as other related organizations.
- It is necessary for these related organizations to correctly implement protective actions under a mutual understanding. Therefore it is also necessary to make effort to ensure a sharing understanding of efforts to be made by determining a policy to implement protective actions by way of the Joint Council for Nuclear Emergency Response with attendance of all relevant parties.

Major content of implementation policy

<ul style="list-style-type: none"> - Basic concept on operation of evacuation and other activities - Securing status of transportation means - Emergency distribution place of potassium iodate tablets - Ensuring status of commodities and fuel needed at evacuation shelter - Means of supply of commodities in case of shortage 	<ul style="list-style-type: none"> - Evacuation destination and evacuation route - Preparation status of evacuation shelter - Points to be noted during evacuation - Countermeasures in case of shortage of transportation means - Other responses to relevant organizations, etc. where necessary
--	---

Visit 7 Evacuation Exercise for Residents on Island

Date and time of visit: Sep. 4 (Mon.) 8:35 - 9:15 (Duration : 40 min.)

Background and Overview

- ◇ Based on an evacuation instructions from the government, residents of Takashima where protective actions are being implemented, will start to evacuate. Residents without passenger cars will gather in Takashima Sports and Culture Exchange Center and evacuate by bus.
- ◇ General residents gathered in Takashima Sports and Culture Exchange Center will take buses chartered by Matsuura City, and leave for the evacuation destination (Hasami Town Athletic Center) specified in the evacuation plan.
- ◇ The status of evacuation using helicopters for those residents still left behind will be observed.

Time	Schedule	Implementation Overview
8:35	Announce evacuation information to residents using the disaster response administration radio, etc.	Residents of evacuation target districts gather at the assembly point (Takashima Sports and Culture Exchange Center) and a roll call is made to check who arrived and who is missing.
8:40	Start the evacuation of general residents via land routes.	Evacuate to the evacuation destination (Hasami Town Athletic Center) using passenger cars and chartered buses.
	Move to Sanri heliport by bus.	
9:10	Start the evacuation via air routes for residents left behind.	Move to the Disaster Prevention Air Center (Omura City) from Sanri Heliport using Disaster Prevention Helicopters of Nagasaki Prefecture, then move to the evacuation destination (Hasami Athletic Center) via land routes.

Move to Hasami Town via land routes and by bus.

Distance from Power Station (Approx. 11 km)

Takashima Sports and Culture Exchange Center

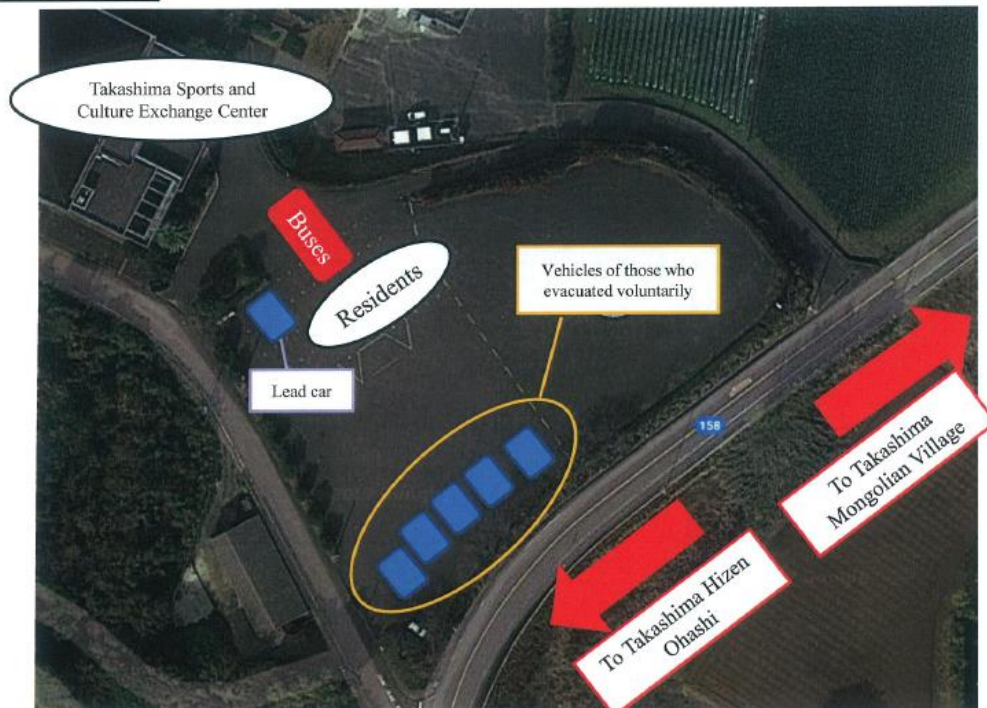
Sanri Heliport

Distance from Power Station (Approx. 15 km)

Takashima Sports and Culture Exchange Center

Visit 7 Evacuation Exercise for Residents on Island

Routes in the Tour

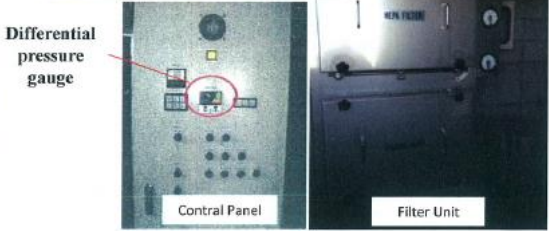


Visit 8 Shelters facilities with radiological protections on Island (Matsuura City Elderly Home)

Date and time of visit: Sep. 4 (Mon.) 9:20 - 9:40 (Duration : 20 min.)

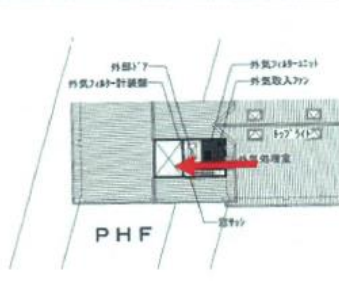
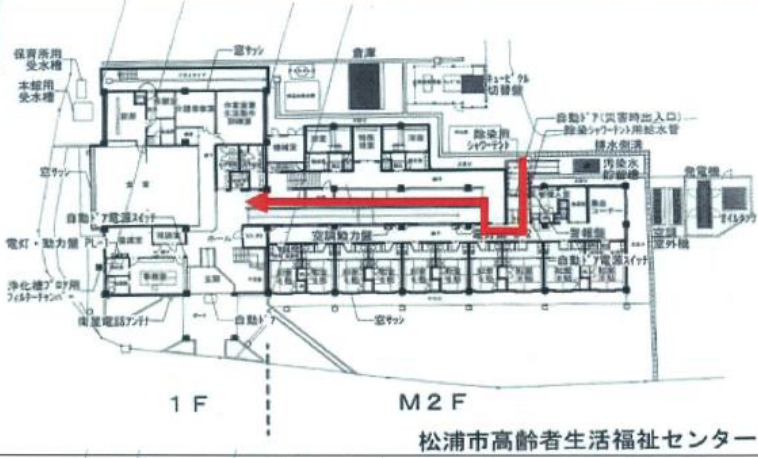
Background and Overview

- ◇ This facility has been maintained as a place to accommodate persons in the target district requiring assistance who would face a higher health risk due to evacuation, based on a request from the government to evacuate residents requiring assistance in PAZ. This facility is located in Matsuura City Elderly Home which is a social welfare facility. This facility accommodates residents of Suisenen and other residents requiring assistance living in the surrounding area.
- ◇ In this facility, radiological protective equipment for sheltering such as the positive pressure management type ventilation system, the radiation protection instruments (such as mask) and daily supplies (such as food) stockpiled for emergencies are observed.



Visit 8 Shelters facilities with radiological protections on Island (Matsuura City Elderly Home)

Routes within the observation Site



Visit 9 Evacuation Exercise at a School (Genkai Mirai Gakuen)

Date and time of visit: Sep. 4 (Mon.) 10:40 - 11:10 (Duration : 30 min.)

Background and Overview

- ◇ Genkai Mirai Gakuen, a school in UPZ, based on instructions from Genkai Town Disaster Management Headquarters, will guide its children and students back to their homes and hand them over to their parents/guardians, and shelter those children and students who could not be handed over to their parents during the general emergency.
- ◇ Based on its own scenario, Genkai Mirai Gakuen will conduct an exercise in response to a case where it has to temporarily relocate based on OIL2. This case is separate from the general scenario of the Nuclear Energy Disaster Prevention Drill this fiscal year.



Time	Schedule
11:00	• Instructions from Genkai Town Disaster Management Headquarters to temporarily relocate
11:00 to 11:10	• Start guiding children and students in the school to evacuate.
Around 11:10	• Start moving to Doing Mikazuki (Ogi City) which is the evacuation destination.

Visit 9 Evacuation Exercise at a School (Genkai Mirai Gakuen)

Routes in the observation Site



Visit 10 Temporary Relocation Exercise for Residents in UPZ (Genkai Town Hall)

Date and time of visit: September 4 (Mon) 12:20 - 12:35 (Duration : 15 min.)

Background and Overview

- ◇ After release of radioactive materials, early protective actions such as temporary relocation are scheduled to take place within a week for regions where a relatively low air dosage (spatial radiation dose rate) is measured, .



Time	Schedule
12:00	• Government instruction for people in areas in UPZ exceeding OIL2 to temporarily relocate
12:01	• Announce evacuation information to residents in Nitta district of Genkai Town using the disaster response administration radio, etc. from Genkai Town Disaster Management Headquarters.
12:01 to 12:30	• Assemble residents without passenger cars at Genkai Town Hall.
12:30	• Start moving to Doing Mikazuki (Ogi City) which is the evacuation destination.

Visit 11 Contamination Screening and Decontamination Exercises (Taku City Athletic Stadium)

Date and time of visit: September 4 (Mon) 13:30 - 14:20 (Duration: 50min.)

Background and Overview

- ◇ To temporarily relocate people within a week based on a government instruction for those in areas in UPZ exceeding OIL2, the tasks of contamination screening, decontamination, and emergency distribution of potassium iodate tablets are planned to be carried out at Taku City Athletic Stadium which is near the boundary of UPZ and along the evacuation route.
- ◇ Based on the above planning, the contamination screening and decontamination exercises conducted by Saga prefecture will be observed.



Time	Schedule
13:20	• Contamination screening of vehicles (Gate Monitor 2 lanes)
13:20 to 14:10	• Decontamination of vehicles exceeding OIL4 using water flow washing (a medium size bus) • Contamination screening for 50 residents (decontamination, 4 lanes) • Decontamination of residents • Distribution of passes
Around 14:10	• Start moving to the evacuation destination.

Contamination Screening Site Image

Taku City Athletic Stadium

Go around the decontamination

[2] Contamination screening for residents (4 lanes) decontamination

Getting in vehicles

Getting out of vehicles

To vehicle decontamination if exceeding OIL4

[4] Distributing passes

mark means traffic controller

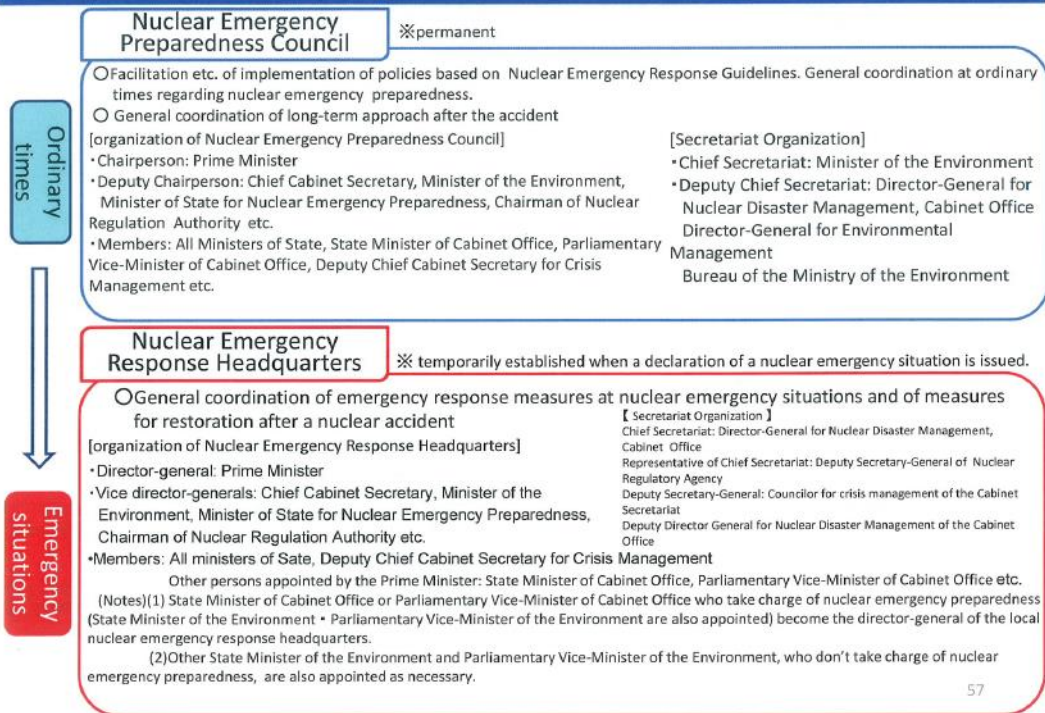
[3] Vehicle decontamination using water flow washing (Japanese Self-Defense Force)

[1] Contamination screening of vehicles (2 lanes)

Basic action to be taken in the event of a nuclear emergency

Emergency class	Example of event	Action
Information collection event	○ An earthquake on the Japanese seismic scale of 5-minus or -plus in a municipality where a nuclear power plant is located	Nuclear Regulation Authority, Cabinet Office, Joint Nuclear Accident Alert Headquarters
Alert	○ An earthquake on the Japanese seismic scale of 6-minus or more in a prefecture where a nuclear power plant is located ○ Issuance of a mega-tsunami warning ○ An event considered by the Chairman to be a severe event	
Site area emergency (Event equivalent to Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness)	○ Leakage of the reactor coolant ○ Station blackout (for more than 30 minutes) ○ Loss of all residual heat removal functions	Nuclear Regulation Authority, Cabinet Office, Joint Nuclear Accident Response Headquarters
General emergency (Event equivalent to Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness)	○ Station blackout (for more than 1 hour) ○ A reactor shutdown failure due to control rod insertion ○ Air dose rate of 5 μSv/h at the site boundary (for more than 10 minutes)	Nuclear Emergency Response Headquarters

Nuclear Disaster Prevention System at Ordinary times-Emergency Situations



Crisis Management Organization in a State of Nuclear Emergency

