

Tentative schedule
Sodium Handling Technology Training Course
-Nuclear researchers exchange program (NREP) in 2007-

(As of Aug. 22)

Date	Training Items	Training Contents
8/22(Wed)	Arriving at Tsuruga St. Moving-in procedure for the apartment	
8/23(Thu)	Orientation of the course Formalities for Entering Monju	
	- Site tour of facilities I. SHIBAHARA	- Site tour of Monju - Tour of MC Square - Tour of sodium handling training facility & Maintenance training facility
8/24(Fri)	<Lecture> - Outline of Monju I. SHIBAHARA	- Feature and design of plant system of Monju ※ Welcome party
8/25(Sat)		
8/26(Sun)		
8/27(Mon)	<Lecture> Fundamental knowledge on sodium M. SAWADA	- Properties, characteristics, hazardous nature, and combustion of sodium - Reason for using sodium as a coolant of FBR
	<Training> Measurement of sodium physical properties	- Measurement of density, melting point, viscosity, surface tension, and specific heat of sodium
8/28(Tue)	<Lecture-1> Fundamental knowledge on sodium handling M. SAWADA <Lecture-2> Sodium cleaning technologies A. BERJON	- Sodium spontaneous ignition mechanism - Caution and accident experience on sodium handling - Hydrogen gas treatment (risk aversion)
	<Training> Sodium fire fighting	- Handling of sodium extinguishers and sodium fire-fighting suits - Visibility experience in sodium smoke - Extinguishing sodium fire - Misuse of general extinguishers against sodium fire - Cleaning of sodium compound
8/29(Wed)	<Training> Sodium handling	- Wiping sodium off - Demonstration of sodium spontaneous ignition - Hazard with residual sodium and water after alcohol treatment
8/30(Thu)	<Training> Chemical reaction of sodium	- Observation of sodium water reaction in the air and inert gas - Observation of reaction with perlite board - Sodium cleaning

8/31(Fri)	<Training> Preparation for sodium loop operation	- Outline of Sodium Loop facilities - Instruction of operating control board - Instruction for on-site and operation
9/1(Sat)		
9/2(Sun)		
9/3(Mon)	<Training> Sodium loop operation	- Preheating operation (temperature control) - Review for the sodium charging methods - Operation for sodium charging (valve operation, and system gas pressure control) - Draining (valve operation, flow confirmation of cover gas)
9/4(Tue)	<Lecture> Sodium corrosion & purity control M. SAWADA	- Mechanism of metal corrosion with sodium - Impurity measurement of sodium (plugging meter) - Sodium purity control method for SFRs
9/5(Wed)	<Training> Sodium loop operation (sodium purification system)	- Preheating operation (temperature control) & sodium charging - Purity measurement of sodium (plugging meter) - Operation for sodium draining
9/6(Thu)	<Training> Observation of reaction of sodium with concrete	- Sodium feeding on concrete - Observation on reaction of sodium with concrete - Sodium compound treatment
9/7(Fri)	<Training> Observation of reaction of sodium with concrete	- Observation of reaction product - Observation on eroded concrete
9/8(Sat)		
9/9(Sun)		
9/10(Mon)	Making reports (in the morning)	
	Attending to the "Tsuruga Summer Institute on Nuclear Energy"	- Debate with students (with the researcher of Fugen) Attending to the welcome party
9/11(Tue)	<Preparatory Lecture>	- Principal and structure of pump
	<Training> Dismantling of sodium pump shaft sealing part	- Dismantling of sodium pump shaft sealing part
9/12(Wed)	<Training> Assembling of sodium pump shaft sealing part (reassembling)	- Assembling sodium pump shaft seal part - Restoration working Attending to the "Tsuruga Summer Institute on Nuclear Energy"
9/13(Thu)	FBR safety evaluation T. AOKI	- Vapor trap open replacing work
9/14(Fri)	Attending to the "Tsuruga Summer Institute on Nuclear Energy"	- Special speech by French lecturer Attending to the "Tsuruga Summer Institute on Nuclear Energy"
9/15(Sat)		
9/16(Sun)		
9/17(Mon)	National holiday	

9/18(Tue)	<Lecture> Monju sodium leakage accident & its safety measures M. SAWADA	- Outline of Monju accident and its cause - Safety measures for the accident - Liner corrosion mechanism (molten salt type corrosion)
9/19(Wed)	<Training> Sodium piping leakage M. SAWADA	- Melting sodium in the charging tank - Melting sodium in the special tank - Observation of sodium leakage phenomenon from piping
9/20(Thu)	<Training> Sodium piping leakage	- Dismantling leaked piping - Observation of bonded sodium inside piping insulator
9/21(Fri)	Making reports Q&A	
9/22(Sat)		
9/23(Sun)		
9/24(Mon)	Make up holiday	
9/25(Tue)	Making reports	
9/26(Wed)	Making reports	
9/27(Thu)	<Preparatory Lecture> - Comparison of LWR with FR T. AOKI	- System structure and feature of LWR - FBR type, system composition and feature
9/28(Fri)	<Lecture> FBR safety measures M. SAWADA	- FR plant safety measures exemplified "Monju" (basic policy, sodium leak measures, sodium water reaction measures)
9/29(Sat)		
9/30(Sun)	Traveling	Traveling to the O-arai Research Center
10/1(Mon)	<Lecture> - Sodium boundary open working on "Joyo" MK-III modeling	- Sodium boundary open working on "Joyo" MK-III remodeling (SHTS main piping cutting, remodeling of main air cooler) - Safety measures and caution during the work
	<Field Work> On-site studies	- Experimental Reactor "Joyo" - Target of modification work for the main piping at secondary cooling system - Target of modification work for main air blast cooler, and others
10/2(Tue)	<Lecture & Field Work> Technical discussion on R&D relating sodium technology	- Activated sodium processing technology (sodium conversion basic test) - Technologies on test of sodium soaking material
	<Field Work> Technical discussion on the High Temperature engineering Test Reactor (HTTR) Leaving O-arai for Tsuruga	- Investigation of comparison of gas with sodium as a coolant

10/3(Wed)	<Preparatory Lecture> Outline of Monju ISI O. MIHALACHE	- Outline of ISI (In-Service Inspection) technology - Outline of Monju ISI devices
	<Training> Monju ISI O. MIHALACHE	- SG tube rupture detection - Reactor vessel inspection service (robot)
10/4(Tue)	Site tour of nuclear power plant Mihama NPP (PWR)	- SG tube rupture accident - SG inlet stop valve break accident
10/5(Fri)	Anniversary of JAEA establishment	
10/6(Sat)		
10/7(Sun)		
10/8(Mon)	National holiday	
10/9(Tue)	<Lecture> Collaborative lecture of University of Fukui	Debate with students at the University of Fukui (with the researcher of Fugen)
10/10(Wed)	<Preparatory Lecture> Outline of Monju plant system Outline of Monju startup and shutdown	Introduction of plant system Transition of plant condition at startup and shutdown operation
	<Training> Outline of simulator Criticality operation Response operation under abnormal simulator	- Instruction of Monju simulator systems - Operation of control rod & confirmation of critical point - Primary system sodium leakage & evaporator water leakage - Loss of external power source
10/11(Thu)	<Lecture> Design of FBR plant system and reactor core & its feature Y. MATSUNO	- Features of FBR plant system design - Features of FBR core design (comparison with LWR)
	<Lecture> Concept of safety and design policy of reactor plant Y. MATSUNO	- Concept of reactor safety ensuring - Safety design of reactor plant system (reactor plant protection system, seismic and decay heat removal)
10/12(Fri)	<Lecture> Design of sodium equipment and its feature M. KAMEI	- Design of sodium equipment and its feature - Feature of sodium pump structural design
10/13(Sat)		
10/14(Sun)		
10/15(Mon)	<Lecture> Current status and future prospect of FRB fuel cycle development in Japan M. SAWADA	- Direction for aiming the development - FBR cycle technology development project - Current status of FRB development in Japan - International cooperation on FBR development
10/16(Tue)	Making reports	

10/17(Wed)	<Training> ISI practical training O. MIHALACHE	
10/18(Thu)	<Lecture> Current status and future prospects of Monju H. MAEDA	Current status and future prospects of Monju
10/19(Fri)	Site tour of nuclear power plant O-i NPP (PWR) Maintenance training facility	- Tour of NPP by see-through - Tour of maintenance training facility at Kansai Electric Power Co., Inc. (with the researcher of Fugen)
10/20(Sat)		
10/21(Sun)		
10/22(Mon)	<Lecture> Technology development at “Joyo” M. TAKAMATSU	- Measurement of CP behavior distribution in PHTS - Surveillance technology of FR structural integrity by using fiber optics - Impurity analysis of cover gas and in-sodium by using laser
10/23(Tue)	Site tour of nuclear facilities Off-site Center and etc.	- Tsuruga Off-site Center - Environment Monitoring Center
10/24(Wed)	Making reports	
10/25(Thu)	Making reports Issue diploma	- Clean up apartment room
10/26(Fri)	Leaving Tsuruga for KIX	