

-The 3rd Sodium Handling Technology Training Curriculum for Chinese-

(Oct. 13, 2005)

Week-1: [Monju Tour, Sodium Properties, & Sodium Handling Exercise]

10/17 (MON)			
PM		<ul style="list-style-type: none"> ✓ Arriving at Kansai Airport ✓ Move to Tsuruga 	<ul style="list-style-type: none"> Arrival at Kansai Airport from Beijing (Mr. Y. Hattori will pick up the researchers at Kansai Airport) Registration for Moving into Kushikawa Company Housing (Ms. Minami will accompany the researchers)

10/18 (TUE)			
AM	8:30-12:00	<ul style="list-style-type: none"> ✓ Several Formalities 	Guidance of Tsuruga City at Kushikawa Company Housing (Ms. Minami will accompany the researchers)
PM	13:00-17:00		Orientation at the International Nuclear Information and Training Center

10/19 (WED)		Training Items	Training Contents
AM	9:00-12:00	Site Tour for Monju Plant I Shibahara	<ul style="list-style-type: none"> Overview of Monju Center Control Room Sodium Leakage Accident Occurred Place (Secondary Cooling System)
PM	14:45-14:55	Courtesy Visit to the Tsuruga Mayor M.SAWADA	Researchers from Fugen NPS will accompany the visit
	18:00-	Welcome Party	At the Kushikawa Guest House

10/20 (THU)		Training Items	Training Contents
AM	9:00-12:00	<u><Lecture></u> ✓ Basic Knowledge about Sodium M. Sawada	-Chemical and Physical Properties of Sodium -Feature of Sodium Combustion and Effect to the body by Sodium Aerosol -Caution on Sodium Fire Extinguish -Reason for Using Sodium as a Coolant of FBR
PM	13:00-17:00	<u><Exercise></u> ✓ Measurement of Sodium Physical Properties K. Ozawa & A. Miyamoto	-5 kinds of Sodium Physical Properties Density Melting Point & Specific Heat (measuring at the same time) Dynamic Viscosity Surface Tension

10/21 (FRI)		Training Items	Training Contents
AM	9:00-10:30	<u><Lecture-1></u> ✓ Fundamental Knowledge on Sodium Handling Working M. Sawada	(Lecture-1) -Mechanism of Sodium Spontaneous Ignition -Caution Matters on Sodium Handling Working -Accident Examples on Sodium Handling Working
	10:40-12:00	<u><Lecture-2></u> ✓ Cleaning and Repairing Technologies P. Grenet	(Lecture-2) -Cleaning Methods -Approach to Hydrogen Risks
PM	13:00-17:00	<u><Exercise></u> ✓ Sodium Handling Working ✓ Demonstration of Accident Example K. Ozawa & K. Hamano	-Observation of Sodium Spontaneous Ignition -Wiping or Removing Sodium on or inside of Complicated Structure -Confirmation dangerousness in the case of Treatment for filled Sodium inside Small Piping by Alcohol Cleaning

Week-2: [Sodium Fire Extinguish, Sodium Loop Operation & Sodium Pump Overhaul Maintenance]

10/24 (MON)		Training Items	Training Contents
AM	9:00-12:00	<Exercise> ✓ Sodium Fire Extinguishing K. Ozawa & K. Hamano	-Wearing of Sodium Safety Suits and Oxygen Inhalation -Visibility under Sodium Aerosol Environment -Demonstration of Sodium Fire Fighting by Using General Extinguisher
PM	13:00-15:00	<Exercise-1> ✓ Chemical Reaction ✓ Waste Treatment of Sodium Compound K. Ozawa & K. Hamano	-Observation of Sodium Chemical Reaction between Sodium and Water under 2 cases (Air and Nitrogen Gas Atmosphere) -Observation of Chemical Reaction between Sodium and Insulator -Water & Steam Cleaning -Clean Up Field
	15:10-17:00	<Exercise-2> ✓ Introduction of Sodium Loop (Preparation Lecture for Sodium Loop Operation) T. Watanabe	-Outline of Sodium Loop System's Configuration -Outline of Sodium Loop Operation Control System

10/25 (TUE)		Training Items	Training Contents
AM	9:00-12:00	<Exercise> ✓ Sodium Loop Operation (Preheating) T. Watanabe	-Preheating Operation used Control System -Confirmation of Preheating Data -Discussion for Charging Operation by Trainee
PM	13:00-17:00	<Exercise> ✓ Sodium Loop Operation (Sodium Charge) ✓ Sodium Loop Operation (Sodium Drain) T. Watanabe	-Gas Pressure Control -Charging Valves Operation -Draining Valves Operation -Confirmation of Sodium Draining Circuit by Gas Pressure

10/26 (WED)		Training Items	Training Contents
AM	9:00-12:00	<Lecture> ✓ Sodium Corrosion Mechanism & Sodium Purification Control in Monju M. Sawada	-Material Corrosion Mechanism by Sodium -Measurement Theory of Plugging Meter -Control of Impurity in the Reactor Plant
PM	13:00-17:00	<Exercise> ✓ Sodium Loop Operation (Sodium Purification) T. Watanabe	-Measurement Impurities in Sodium Loop used Plugging Meter -Charging & Draining Sodium Operation

10/27 (THU)		Training Items	Training Contents
AM	9:00-12:00	<u><Exercise></u> ✓ Overhaul Working for Sodium Pump's Mechanical Seal Part J. Ootsuka & T. Uesugi	-Dismantling Procedure for Monju Secondary Pump's Mechanical Seal Part -Setting Up of Maintenance Machine
PM	13:00-17:00	<u><Exercise></u> ✓ Dismantling Working J. Ootsuka & T. Uesugi	-Dismantling Working of Pump's Mechanical Seal Part

10/28 (FRI)		Training Items	Training Contents
AM	9:00-12:00	<u><Exercise></u> ✓ Assembling Working J. Ootsuka & T. Uesugi	- Assembling Procedure for Pump's Mechanical Seal Part -Assembling Working Pump's Mechanical Seal Part
PM	13:00-17:00	<u><Exercise></u> ✓ Assembling Working J. Ootsuka & T. Uesugi	-Assembling Working (Continue) -Restoration Working -Data Check Centering Data Clearance Data Pump Rotating Check, etc.

Week-3: [Monju Leak Accident, Sodium Piping Leak, FBR Plant & Core Design Feature]

10/31 (MON)		Training Items	Training Contents
AM	9:00-12:00	<Lecture> ✓ Monju Sodium Leakage Accident and Its Safety Measures M. Sawada	-Outline of Monju Accident -Cause of Monju Accident and Its Safety Measures -Corrosion Mechanism of Steel Plate by Leaked Sodium Sodium-Iron Double Oxidization Type & Molten Salt Type Corrosion
PM	13:00-17:00	<Exercise> ✓ Demonstration of Sodium Piping Leakage T. Watanabe	-Melting Sodium in the Special Sodium Tank -Confirmation of Preheating Data of Imitation Sodium Leakage Piping -Observation of Sodium Leakage Phenomenon from Piping

11/1 (TUE)		Training Items	Training Contents
AM	9:00-12:00	<Exercise> ✓ Dismantling of Leaked Piping T. Watanabe	-Treatment of Leaked Piping -Observation of Bonded Sodium inside Piping Insulator
PM	13:00-17:00	<Exercise> ✓ Dismantling of Leaked Piping ✓ Waste Treatment of Sodium Compound T. Watanabe	-Water & Steam Cleaning -Clean Up Field

11/2 (WED)		Training Items	Training Contents
AM	9:00-12:00	<Lecture> ✓ Design and Feature of Sodium Components for Monju M. Kamei	-Design Feature of Heat Transfer System -Design Feature of Main Sodium Components Reactor Vessel Mechanical Pump Intermediate Heat Exchanger Steam Generator
PM	13:00-17:00	<Exercise> ✓ Design and Feature of FBR Plant System ✓ Design and Feature of FBR Reactor Core Y. Matsuno	-Comparison between FBR and LWR on Plant System Design and its specifications -Comparison between FBR and LWR on Core Design and its specifications

*11/3 is a national holiday.

11/4 (FRI)		✓ Tour to LWR Plant (Kansai Electric Company)	Visit to Ooi Power Reactor Plant Visitor Center (Sawada will take care)
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Week-4: [Reaction with Concrete, Boundary Open Working, Monju Simulator Operation]

11/7 (MON)		Training Items	Training Contents
AM	9:00-12:00	<p><Exercise> ✓ Experiment Preparation of Chemical Reaction between Sodium and Concrete T. Watanabe</p>	<p>-Melting Sodium in the Special Sodium Tank -Confirmation of Preheating Data of Imitation Sodium Leakage Piping</p>
PM	13:00-17:00	<p><Exercise> ✓ Demonstration of Chemical Reaction between Sodium and Concrete T. Watanabe</p>	<p>-Observation of Chemical Reaction Phenomenon from between Sodium and Concrete -Observation of Sodium Chemical Compounds produced by Reaction with Concrete (Confirmation of Erosion Situation by another Experiment) -Clear Away of Field</p>
11/8 (TUE)		Training Items	Training Contents
AM	9:00-12:00	<p><Exercise> ✓ Observation of Produced Sodium Compounds ✓ Waste Treatment of Sodium Compounds T. Watanabe</p>	<p>-Confirmation of Erosion State on Concrete Surface -Water & Steam Cleaning -Clean Up Field</p>
PM	13:00-17:00	<p><Lecture> ✓ World FBR Information H. Oshita</p>	<p>-Current Status FBR Development and its Operation in the World -Example of Various kinds of FBR Accidents</p>
11/9 (WED)		Training Items	Training Contents
AM	9:00-12:00	<p><Exercise> ✓ Sodium Boundary Open Working T. Watanabe</p>	<p>-Working Procedure Open of Vapor Trap (V/T) in Sodium Loop under Inert Gas Atmosphere -Making Boundary by Using Vinyl Bag</p>
PM	13:00-17:00	<p><Exercise> ✓ Sodium Boundary Open Working T. Watanabe</p>	<p>-Open Boundary and Take Out V/T -Cleaning Up of V/T -Restoration to the former condition</p>

11/10 (THU)		Training Items	Training Contents
AM	9:00-12:00	<u><Lecture></u> ✓ Introduction of Monju Heat Transfer System ✓ Outline of Monju Start Up & Shutdown Operation N. Koyagoshi	-Introduction of Heat Transfer System's Operation -Transition of Plant State During Start Up Operation
PM	13:00-17:00	<u><Exercise></u> ✓ Outline of Monju Simulator ✓ Simulator Operation for Monju Start Up N. Koyagoshi	-Introduction Monju Simulator System -Simulator Operation Procedure -Critical Operation -Start Up Operation of Turbine Generator -Connecting Operation to Electrical Grid

11/11 (FRI)		Training Items	Training Contents
AM	9:00-12:00	<u><Exercise></u> ✓ Simulator Operation for Monju Power Up N. Koyagoshi	-Automatically Operation Mode -Start Up of Main Water Charging Pump -Plant Control System
PM	13:00-17:00	<u><Exercise></u> ✓ Simulator Operation under Abnormal Condition N. Koyagoshi	-Reactor Trip by Manual -Sodium Leak in Primary System -Sodium Leak in Secondary System -Heat Pipe Rapture in Steam Generator -Loss of Electric Power

Week-5: [Tour to Oarai Engineering Center, Discussion with Monju]

11/13 (SUN)			
PM		✓ Business Trip to Oarai Engineering Center (OEC)	Move to Ibaraki Prefecture (about 100m far from Tokyo) Stay at Asahi Guest House in OEC (Sawada will escort)
11/14 (MON)		Training Items	Training Contents
AM	9:00-12:00	<Lecture> ✓ Sodium Boundary Open Working on JOYO MK-3 Reconstruction Project	((JOYO: Experimental Fast Reactor) -Secondary Main Piping Cutting -Main Dump Heat Exchanger -Safety Measure & Caution Points during Construction Working
PM	13:00-17:00	<Exercise> ✓ Field Survey	-JOYO Plant System -Secondary Main Piping Cutting Parts -Main Dump Heat Exchanger Parts, etc.
11/15 (TUE)		Training Items	Training Contents
AM	9:00-12:00	<Lecture & Exercise> ✓ R&D for Advanced Sodium Technologies	-Radioactive Sodium Treatment Technology (Basic Testing for Sodium Conversion) -Material Testing for Alloy Soaked in Sodium
PM	13:00-17:00	✓ Leave from Oarai	Back to Tsuruga
11/16 (WED)		Training Items	Training Contents
AM	9:00-12:00	<Discussion> ✓ Present Situation and Future Program for Monju H. Maeda	-Free Talk about Monju Project
PM	13:00-17:00	<Making Report> ✓ Question & Answer ✓ Farewell Party	Comment, Question & Answer and Request about Training Program (Sawada will take care) at the Kushikawa Guest House
11/17 (THU)		Training Items	Training Contents
AM	9:00-12:00	<Making Report> ✓ Making Report	Making Report
PM	13:00-17:00	✓ Clean Up Apartment Room & Checking by JAEA	Issue Diploma
11/18 (FRI)		✓ Leaving from Tsuruga	Back to China from Kansai Airport