

# Implementation and Rollout Strategy for the Nuclear Power Industry

Munich, October 15, 2009

- ☒ **Slovenské elektrárne (SE, a.s.) Overview**
- ☐ Vision and Need for Change
- ☐ Project Goals and Benefits
- ☐ Project Organization, Plan and Achievements
- ☐ Change Management
- ☐ Key Success Factors

# Slovenské elektrárne (SE, a.s.) Overview

SE, a.s. is the second largest utility company in Central and Eastern Europe, and occupies a strategically important position in the Slovak Republic's power sector.

SE, a.s. owns an optimal production portfolio comprised of nuclear, thermal and hydroelectric power plants.

## Installed Capacity:

- Nuclear 1.760 MW
- Thermo 1.398 MW
- Hydro 2.399 MW (\*)



(\*) 746 MW of installed power (Gabčíkovo) is owned by Vodohospodárska výstavba, š.p

# Slovenské elektrárne (SE, a.s.) Nuclear Installations

**Bohunice (EBO)**



Plant Location: Western Slovakia, near Trnava

## Technical Parameters:

Installed Capacity: 880 MW (2x440 MW)

Number of Units: 2

Fuel: Low Enriched Uranium

Type of Reactor: WWER 440 / V213

Year of Commissioning: 1984-1985

**Mochovce (EMO)**



Plant Location: South Slovakia, near Nitra

## Technical Parameters:

Installed Capacity: 880 MW (2x440 MW)

Number of Units: 2 + 2 Under Construction

Fuel: Low Enriched Uranium

Type of Reactor: WWER 440 / V213

Year of Commissioning: 1998, 2000

# Agenda

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# Nuclear Operations Vision

“To Achieve Top Decile Performance in Safety,  
Reliability, Production, and Efficiency and  
Become the World’s Premier Operator Of  
VVER\* Technology”

(\*) Водо-водяной энергетический реактор (Russian);  
*Vodo-Vodyanoi Energetichesky Reactor (Slovak);*  
*Water (cooled) Water (moderated) Energetic Reactor (English)*

# SE, a.s. Nuclear

## The Need For Change

- ❑ The long term performance goals for SE Nuclear require performance in the worldwide Pressurized Water Reactor group top decile
- ❑ Significant changes in processes, organizational structure, and the values and behaviours of the Organization must occur to achieve top decile performance
- ❑ Gaps to Nuclear Industry Best Practice exist in many programs
- ❑ Current Software Systems will not support Industry Best Practice Programs
- ❑ Current Software Systems are not in use outside of the Slovak Republic
- ❑ Many current nuclear business processes are not fully integrated
- ❑ Inconsistent program application exists between EMO and EBO; internal Best Practices not implemented



# The Need For Change

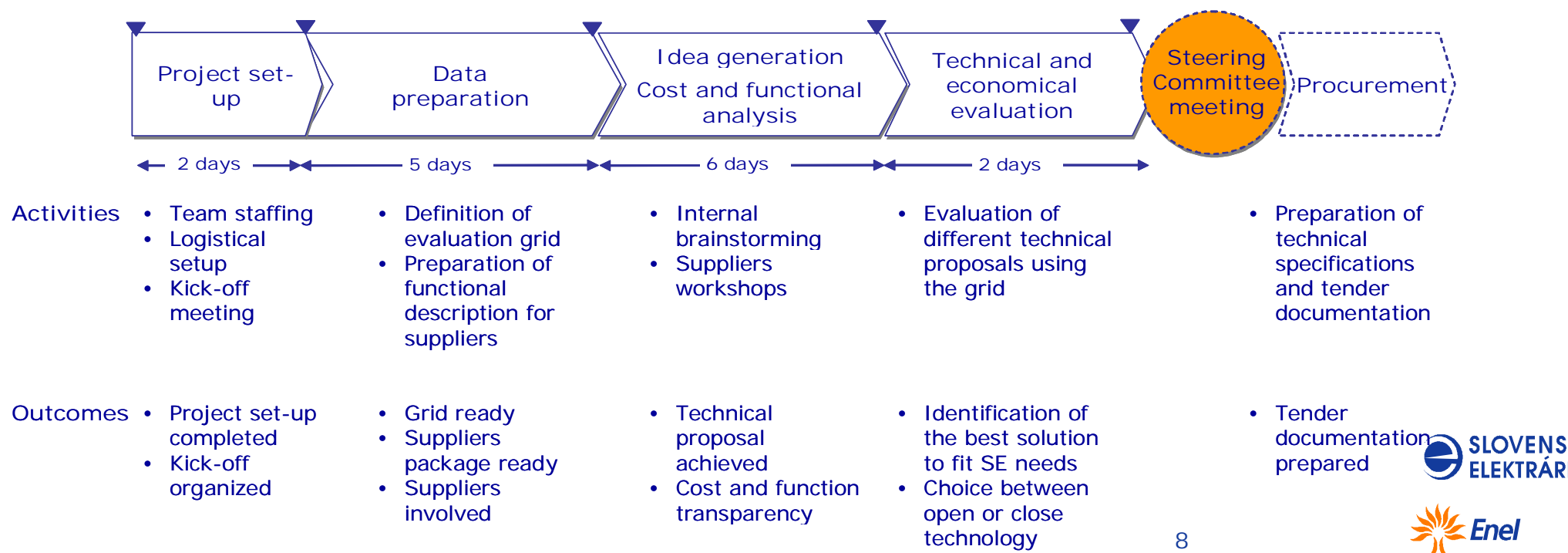
## Scouting for a new solution

A specific assigned Design to Cost team evaluated in July 2007 the main solutions in nuclear maintenance with the main focus on three areas:

**Functional, Technical, and Commercial**

A detailed grid matrix was prepared for each area and filled in by each supplier after discussions conducted with each vendor.

The team afterward evaluated all of the data, requested additional clarifications on specific points and provided a ranking for each area and each vendor.





# Scouting for a new solution

## Why SAP

Although there were strengths and weaknesses for all of the options the overall conclusion of the team was that the solution better covering functional and technical requirements was SAP.

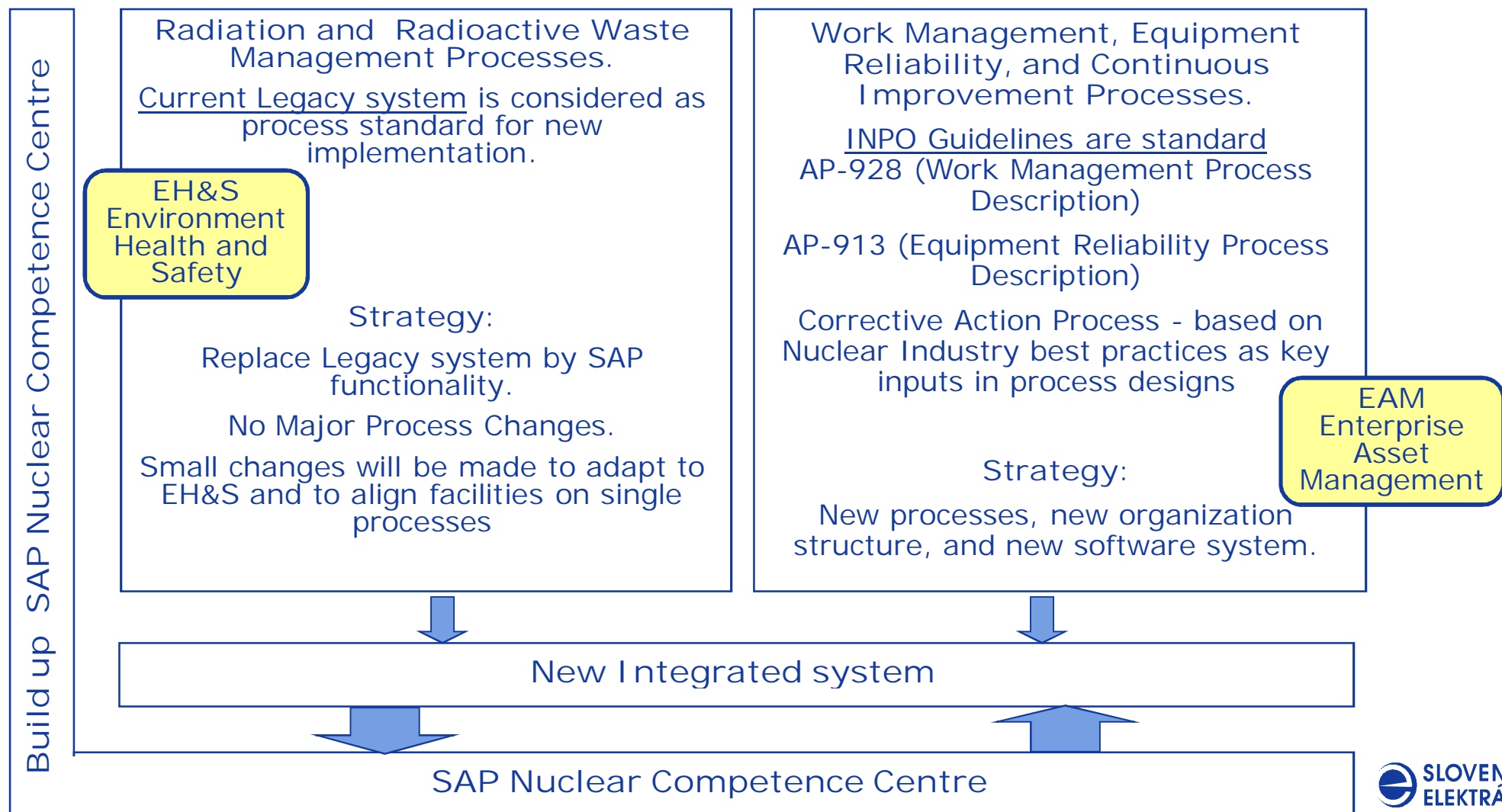
- ❑ The implementation of SAP solution for nuclear power plants follows best-practices of the most effective and high performing nuclear power plants.
- ❑ The solution is based on generally accepted and proven world-wide process standards.
- ❑ SAP is one of the most common technology for energy and utility businesses within Europe. There are a lot of possible skilled suppliers in Europe and in Slovakia as well.
- ❑ SAP technology fits general ENEL strategy in the information systems area. It allows the sharing of ENEL Group technology, resources and know-how.
- ❑ Native integration with current ENEL SAP system is a great advantage and simplifies solution architecture reducing possible integration risks.

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# Project Objectives and Strategy

Improve EBO and EMO performance  
to the level of the most efficient world wide nuclear plants.



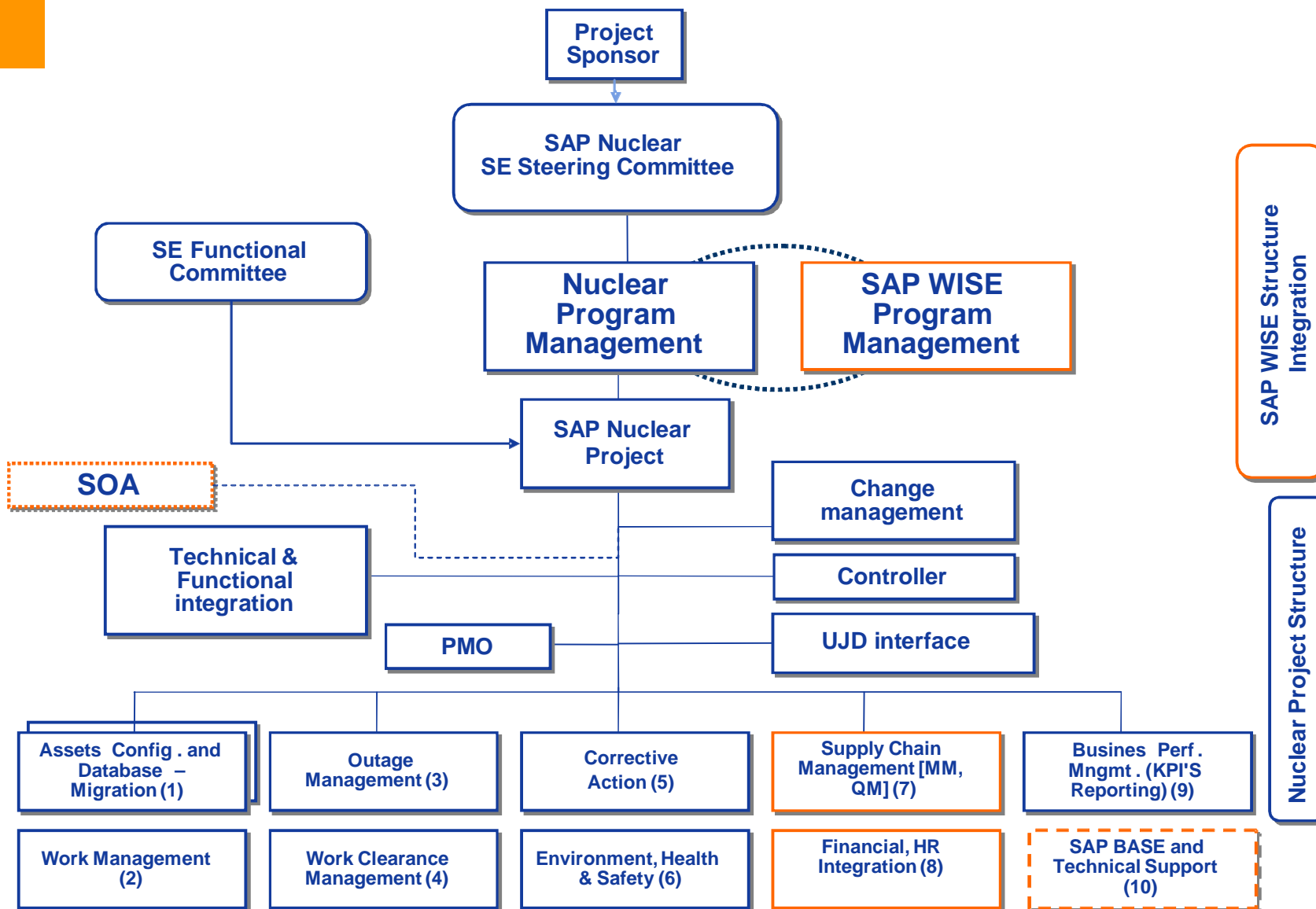
# SAP Nuclear Implementation

## Expected Benefits

- ❑ Greatly enhance the sharing of performance data and facilitate performance improvement through benchmarking and peer assistance.
- ❑ Accelerant to process, organizational, and behavioral change and lead to significant gains in safety, efficiency, plant performance, and organizational behavior
- ❑ Improved Safety Performance
  - Nuclear
  - Industrial
  - Environmental
  - Increased Safety Margins
- ❑ Improved Operational Performance
- ❑ Improved Financial Performance
- ❑ Global corporate solution for Nuclear within Enel Group

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# Project Organization Structure

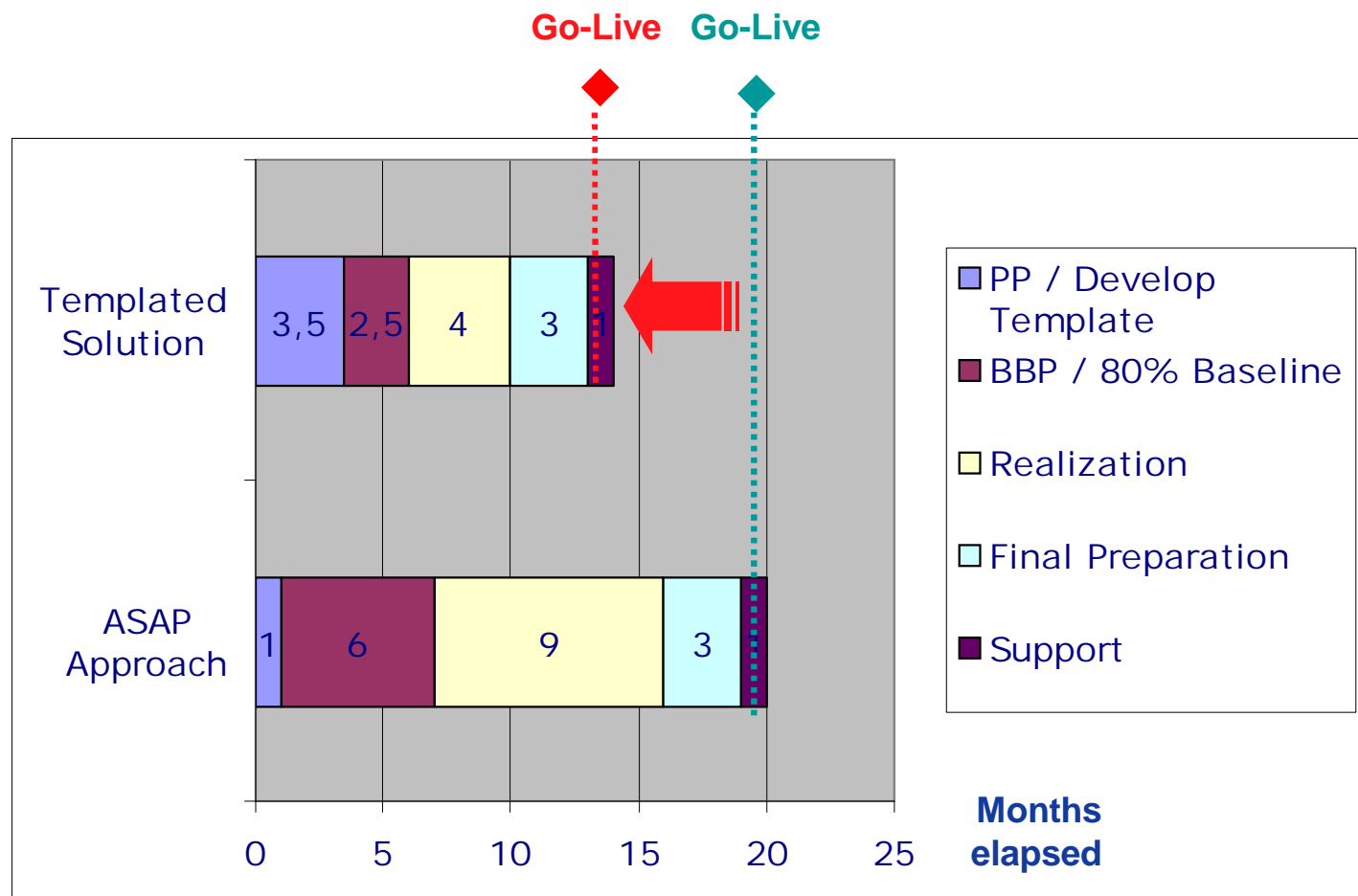






# Project Approach

- ❑ A Management Team that is experienced with nuclear SAP EAM projects and their required critical success factors
- ❑ A unique team of senior, experienced consultants that have both deep nuclear and SAP EAM experience
- ❑ Knowledge on how to make SAP work effectively for nuclear plant requirements
- ❑ Understanding of EAM best practice in the nuclear environment (e.g. INPO guidelines; work-week cycle, corrective action models etc)



Estimated reduction of elapsed: **6 months**

# Project doctrine

- ❑ Eliminate risks
  - Risk management
  - Mitigation plans, and 100% testing
- ❑ Secure and Seamless Go Live
  - 2 months stabilization period before affected nuclear plant outage
  - Approved all SLA, trained SAP Nuclear Competence Centre
- ❑ Training milestones approach
  - 100% end users trained before Go Live
- ❑ Extensive Line Organization Involvement
  - All effected functional areas represented on team
  - Over 120 line organization team members

# Project doctrine

- ❑ Open nuclear behaviour
  - Every project team member has the right and commitment to raise possible or substantive risks or problems
- ❑ SOX compliant
  - Approved processes and procedures up to the end user level
  - 100% project documentation
- ❑ Focus on Change Management
  - Organization alignment
  - Training
  - Communications

# Main achievements

## Implemented SAP Modules

Sap Module	Process
PM	Asset Hierarchy and Database (Technical Objects)
	Maintenance Program (Maintenance Plans)
	Work Management (Maintenance Processing)
	Outage Work Management
	Corrective Action Program
WCM	Work Clearance Management - Safety Tagging and permits
WEC	Work efficiency component enhancements
MM	Supply Chain Management
FI-CO	Integration with work management
HR	Integration with Work management and Radiation an protection system
EHS	<ul style="list-style-type: none"> <li>- Laboratory measurement</li> <li>- Radioactive sources transportation</li> <li>- Chemical management</li> </ul>

## User Roles Required

System set up - Roles	#
EAM system roles created	> 70
EHS system roles created	> 20

- Authorization concept based on:
  - Plant
  - Document types (WO, Notification)
  - User and system statuses
- Roles compliant with Segregation of Duties requirements

# Implementation - SAP EAM and EH&S RICEFW

Reports, Interfaces, Conversions, Extensions, Forms and Workflow

## EAM

EAM area development:

Even though the template approach significantly reduced the need for specific development, still relevant custom implementations were needed mainly of extensions but also of forms and interfaces in order to localize according to Slovak law and local regulatory authority

EAM Interfaces:

- SAP – Primavera (for planning and scheduling): 3 interfaces built (inbound, outbound and master data sharing)
- SAP – Web application for notification and order tracking: 1 interface built

## EH&S

EHS area divided as following:

- Implemented in SAP (6 processes): Laboratory Measurements (EHS), RA sources transportation (EHS), Chemical management processes (EHS), R-orders (PM), Alara (PM) and professional and health capability (HR module)
- Implemented in the Radiation & Protection system (5 processes): External, internal and operational dosimetry, Single entry permit and Hygienic loop
- Implemented in Local db (1 process): Radioactive waste management

EHS interfaces:

- From SAP to R&P system: R-order and HR data
- From R&P system to SAP: R-order and doses

# Migration into SAP EAM & EHS – data volumes

## Migration into SAP EAM

Load item	Data owner	# of records
Work Center	WWM	500
Characteristic (FLOC) - Header	ACM	500
Classes creation and characteristic assignment (FLOC)	ACM	500
Strategies	EQR	80
Task list - header + long text	EQR	6.100
Task list - operations + long text	EQR	incl. above
FLOC - header + long text	ACM	400.000
FLOC - classification values	ACM	8.850.000
Maintenance plans	EQR	81.000
Equipment - header + long text	ACM	35.000
Object links	ACM	160.000
Template notifications	WCM	3.000
Material masters	SCM	159.000
Material masters - classification master data and values	SCM	1.000.000
Material BoM	SCM	9.000

## Migration into SAP EH&S

	Load item	# of records
Laboratory Measurement and Releases	Agents/Substances	500
	Work Area	200+30000
	Phrases	100
Laboratory of Radiation Control Environment	Agents/Substances	1.000
	Work Area	1500+2000
	Phrases	150
RA sources	Agents/Substances	2.000
	Phrases	2
RA protocols	Agents/Substances	20
	Phrases	20
Chemical management	Agents/Substances	3.000
	Phrases	50
	MSDS	2.000
Cross Process	Characteristics and Classes	300
	Dependencies	600

- ❑ All the data were loaded using standard SAP loading programs.
- ❑ Migration activities included 4 data migration tests, each of them approved by the corresponding k-user:
  - Unit test - Product test
  - 3 Mock conversion cycles
- ❑ For EAM migration required in the preliminary go live, more than 200 files were loaded.

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# Change Management

## PLANNING

- Organization / process alignment
- Communication plan
- Training plan
- SOX
- Logistics

## COMMUNICATION

- Newsletters
- Intranet SE/ENEL
- Events
- Behaviors
- Feedbacks
- Third parties communication

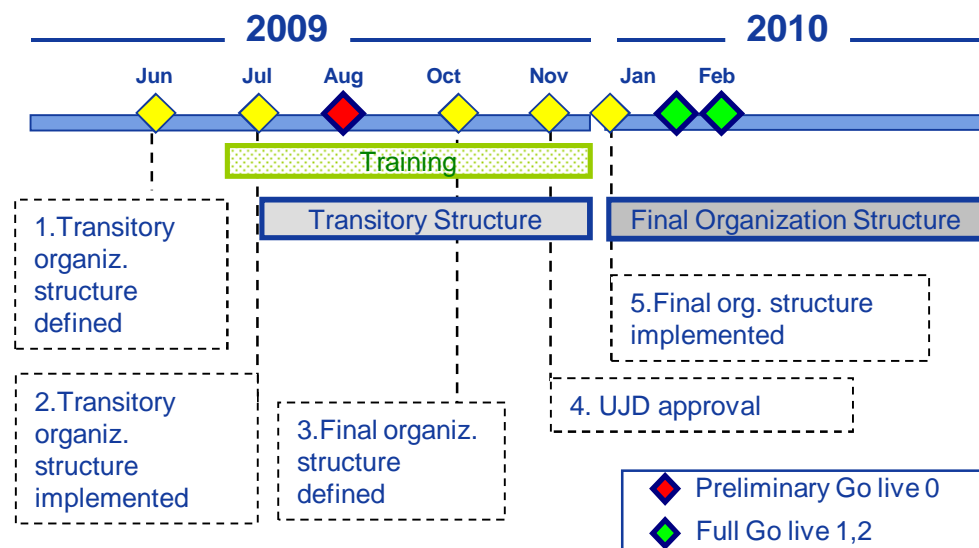
## EXECUTION

- Perform training
- Evaluation
- Go Live Readiness Assessment
- Post Go Live Monitoring

# Impacts on Organization and Procedures

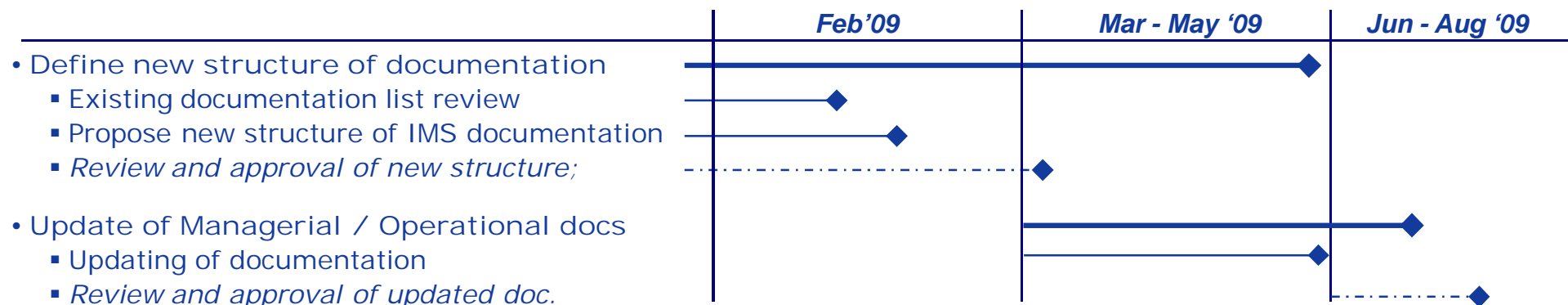
## Changes in the Organizational Structure:

- Transitory organization structure needed since Preliminary Go Live
  - For positions that start performing new roles before the end of 2009
  - Nomination to 'project' positions under authority of General Director / Plant Director order
- Final organization structure implementation as of Jan 1st, 2010



## Process Documentation Updates:

- As preparation for training and go live, existing procedures were updated based on the new processes



# Communication plan

Wave	Key messages	Timing
I.	<ul style="list-style-type: none"> <li>▪ Why is SAP Nuclear undertaken</li> <li>▪ Objectives of the project</li> <li>▪ Key attributes of INPO processes</li> <li>▪ Project plan and milestones</li> </ul>	Jan '09
II.	<ul style="list-style-type: none"> <li>▪ Key SAP Nuclear processes</li> <li>▪ Key process changes</li> <li>▪ Key concepts of SAP Nuclear Training Program</li> </ul>	Feb '09 – Mar '09
III.	<ul style="list-style-type: none"> <li>▪ Process model</li> <li>▪ New organization structure</li> <li>▪ Go-Live Strategy and Go-Live 0 scope</li> <li>▪ Go-Live 0 Training Plan</li> </ul>	Apr '09 – May '09
IV.	<ul style="list-style-type: none"> <li>▪ Integration test outcomes</li> <li>▪ Process documentation changes</li> <li>▪ Go-Live 1/2 Training Plan</li> </ul>	Jun '09 – July '09
V.	<ul style="list-style-type: none"> <li>▪ Post Go-Live monitoring, experience sharing</li> <li>▪ Go-Live Strategy and Go-Live 1,2 scope</li> </ul>	Sep – Dec '09
VI.	<ul style="list-style-type: none"> <li>▪ Helpdesk support transition (from "project mode" to steady-state situation)</li> <li>▪ Continuous improvement initiatives (as results of the Go live 1&amp;2 monitoring, feedbacks from users, etc...)</li> </ul>	Jan – Mar '10

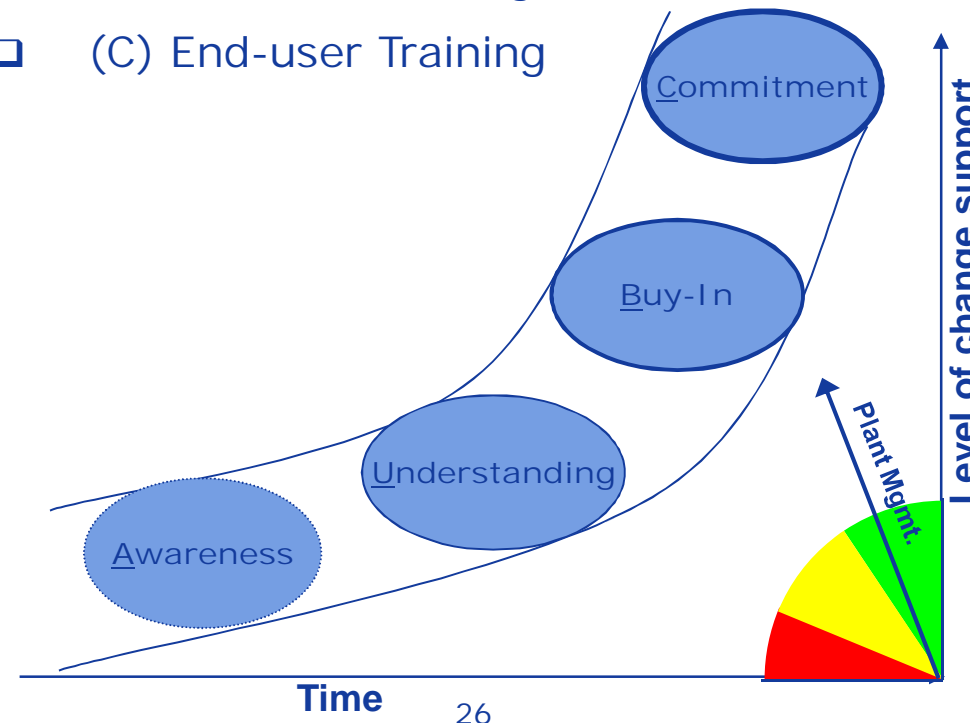
Information

Instructions

# Communication activities (prior to Go-Live)

- ❑ (A) Stakeholders Expectation survey
- ❑ (A) Business Blueprint Demonstrations
- ❑ (A) Cascade Meetings – SAP Nuclear overview communicated to all 3 cascade levels
- ❑ (U) Process Presentations at Plants
- ❑ (U) Org structure Risk identification and assessment brainstorming session
- ❑ (B) Role to positions mapping workshop
- ❑ (B) Initial Go-Live Readiness Committee

- ❑ (B) Go-Live Readiness Committee (scheduled every month)
- ❑ (B) Communication kit for Line Managers
- ❑ (B) Process Meeting with Team Leads
- ❑ (C) Personal Meetings
- ❑ (C) End-user Training



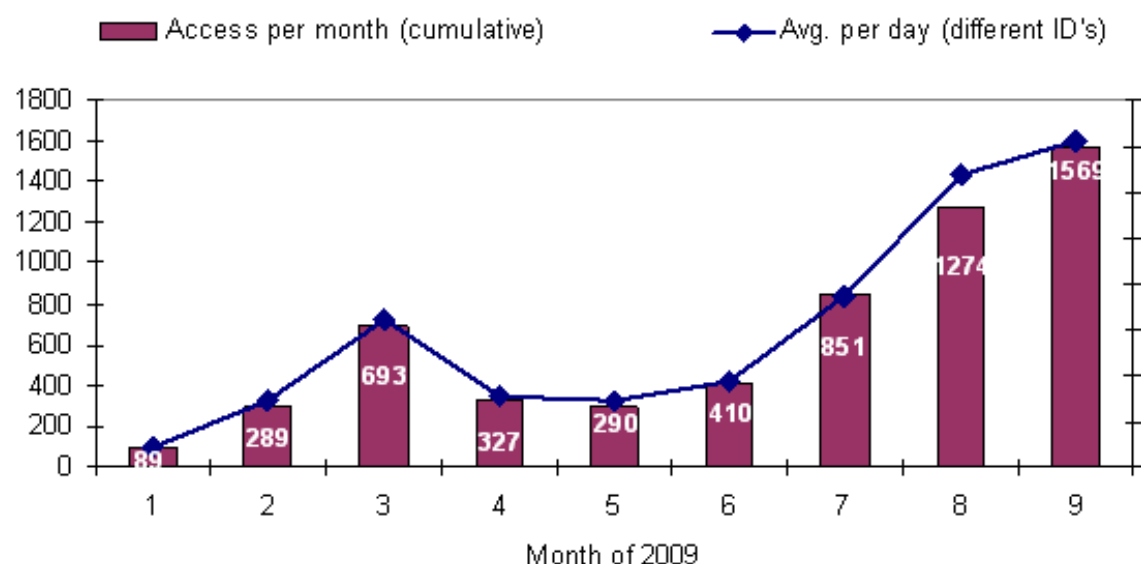
# Intranet Portal

[http://intranet.seas.sk/?sap\\_nuclear](http://intranet.seas.sk/?sap_nuclear)

Content:

- ❑ General project information
- ❑ Description of re-defined processes
  - Process Designs
  - Key changes
- ❑ Go-Live Strategy
- ❑ End-user Guide for all Plant employees
  - Training materials and users manuals
  - Relevant process documentation
  - NG notification creation guide
  - SAP W1S sandbox guide
  - Web application guide
- ❑ Training (Strategy, detailed Plan, list of Training Courses, List of Trainers/Key users)
- ❑ Frequently Asked Questions

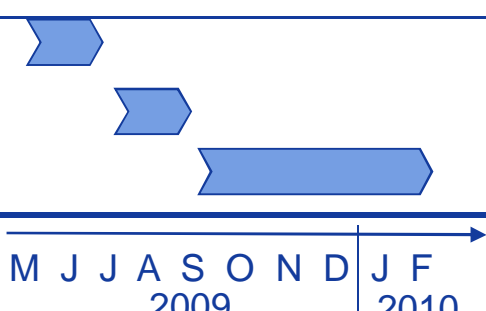
Average number of visits:



- Project Introduction + Process presentations + Process documentation + List of users and role assignment
- Project Teams + Business Concepts + SAP training version + Role descriptions
- Training materials
- Business Concepts

# Training Strategy

## Key attributes

#	Trainer	Target audience	~ Users	Timeline
I.	Supplier	SE trainers	60	
II.	SE trainers	Pilot end-users for Go-Live O	300	
III.	SE trainers	End-users for Go-Live 1,2	2000	

M J J A S O N D J F  
2009 2010

### Guiding Principles

- ❑ Training sessions consist of end-to-end process and system part
- ❑ Training sessions organized by system roles
- ❑ „Train the trainer“ approach
- ❑ Instructor-led training sessions supported by user manuals
- ❑ Use of case studies, test and feedback
- ❑ System access conditional upon passing the training test

### Key Critical Success Factors

- ❑ Timing of training as close to Go-live dates as possible
- ❑ System roles assigned to end-users prior to trainings
- ❑ Clear communication related to training organization performed directly to participants
- ❑ Training materials available on the project intranet portal
- ❑ Each trained employee will retain the access to entire training material and role and process description

# Training Program

- ❑ Training in period between July 2009 -December 2009
- ❑ ~ 9000 MDs of Training to be delivered to 110 business roles
  - 56 system-based training courses
  - 4 presentation-based Training
- ❑ 63 internal SE trainers to be trained and deliver training to end-users
- ❑ 10 training rooms to be utilized
- ❑ High-level Training Plan:
  - Respective of outage periods, shift work weeks of trainers and participants
  - Training times: Monday – Friday 7.30 – 15.00

Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09
Work Management - Planning		Work Management - Planning / Execution		Work Management - Execution / Identification	
Online & Outage Scheduling (EMO)	Work Clearance Management - Preparation		Equipment Reliability (EBO)	Environment, Health & Safety	
Equipment Reliability (EMO)	Corrective Action Program, Self-assessment & benchmarking, Operational Experience (Core team)		Work Clearance Management & Permits - Preparation & Execution		Performance Monitoring
Material Management			Online & Outage Scheduling (EBO)	Continuous Improvement for Managers and Employees	
Outage EBO		Outage EBO	Outage EMO		



# End-user Training

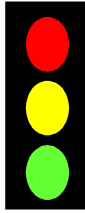
- ❑ In the project about 2300 SAP end-users has to be trained
- ❑ Depending on the assigned roles it can happen that the same user needs to attend more than one course

Process Area	Attendance
Outage Mgmt.	160
Work Mgmt.	1028
Equipment Reliability	271
Supply Chain Mgmt.	66
Asset Conf. & Migration	10
Work Clearance Mgmt.	924
Corrective Action Prog.	180
Environ., Health & Safety	844

**Total: 3483**

# Go-Live Readiness

- ❑ The purpose of the Go-Live Readiness Committee (GLRC) is:
  - Enable direct exchange of information between Project and Plant Management and build the Plant Management ownership of the SAP Nuclear implementation
  - Regularly and continuously inform the key Plant management of the progress on SAP Nuclear Go-Live preparation, highlighting the preparation progress and issues in all aspects of go-live:
 

▪ Process	▪ People/ Organization	
▪ Technology	▪ External Environment	
▪ Cutover	▪ Post Go-live Support	
  - Obtain the Plant Management views and resolution support for Go-Live preparation activities in their NPP
- ❑ First GLRC meetings are planned for: Jun 16<sup>th</sup>, 2009 in EBO; Jun 23<sup>rd</sup>, 2009 in EMO
- ❑ The full list of specific Go-Live prerequisites will be tracked and managed in a Go-Live Readiness Tool by SAP Nuclear Project Management
- ❑ The assessment will be carried out by PrM and responsible person in 3 stages before Go-Live:
  - Assessment 2 – preliminary assessment after integration testing
  - Assessment 1 – pre-final assessment 2 weeks before Go-Live – input for GLRC Go/No Go decision
  - Assessment 0 – final assessment 1 day before Go-Live

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## Key success factors

- ❑ Top management sponsorship and commitment
- ❑ Business line extensively involved in the project
- ❑ Focus on change management – Training, organizational alignment, communication
- ❑ Template based approach using a partner with significant experience in the nuclear field
- ❑ Targets clearly defined at every level of the project
- ❑ Strong leadership of the project with constant monitoring and addressing of issues
- ❑ Continuous risk monitoring

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