Establishing Nuclear Safety Infrastructure for Countries Embarking on Nuclear Power

DESIGN AND SAFETY ASSESSMENT REVIEW SERVICE (DSARS)

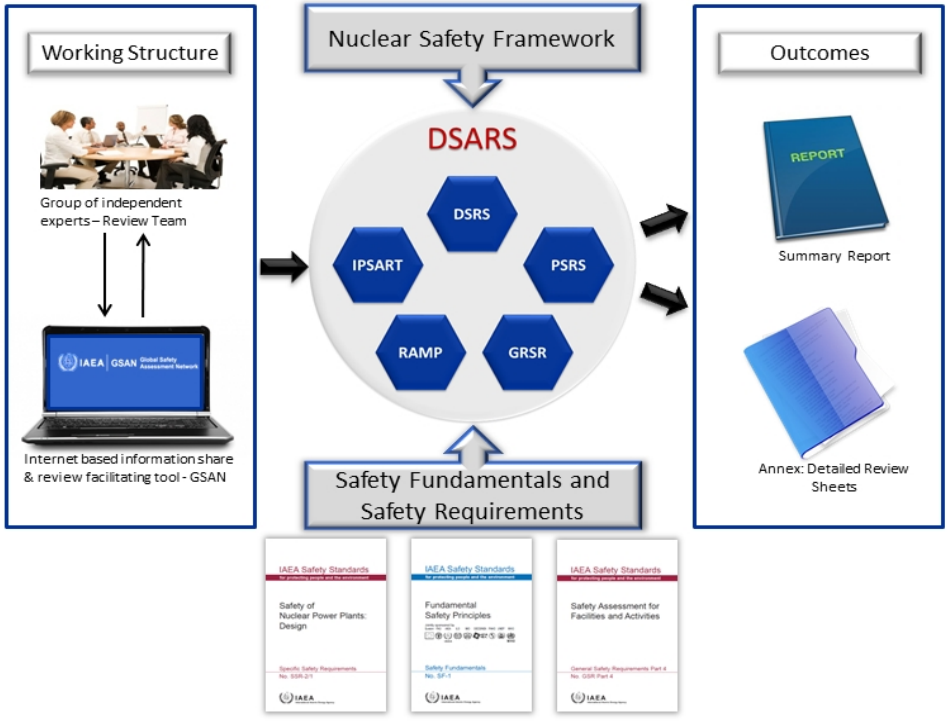
The Safety Assessment Advisory Programme (SAAP)

SAFETY ASSESSMENT SECTION
DIVISION OF NUCLEAR INSTALLATIONS SAFETY
DEPARTMENT OF NUCLEAR SAFETY & SECURITY

International Atomic Energy Agency

DESIGN AND SAFETY ASSESMENT REVIEW SERVICE (DSARS)

The DSARS is an integrated IAEA design and safety review service using a modular approach to addresses the design and safety assessment needs of IAEA Member States at all stages of development and implementation of the Nuclear Power Programme.



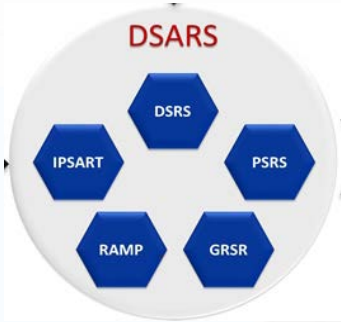
DESIGN AND SAFETY ASSESMENT REVIEW SERVICE (DSARS)

DSARS OBJECTIVE:

To provide to the requesting Member State a tailored, independent peer review and assessment of the plant design safety and to make recommendations on additional actions/analysis to be carried out to meet the IAEA Safety Standards and to enhance safety.

- Assisting in establishing national regulations related to design and safety assessment through their review
- Review of existing and proposed nuclear plant designs
- Review of specific sections of the safety analysis in support of licensing
- Review of safety assessments in support of plant modifications
- Assessing actions taken to address emerging safety issues
- Review of a countries Periodic Safety Review programme

DESIGN AND SAFETY ASSESMENT REVIEW SERVICE (DSARS)



DSARS MODULES

- *Design Safety Review (DSR)*– Review of the safety analysis report preliminary or final using IAEA safety requirements and safety guides *incl. Generic Reactor Safety Review (GRSR) for new NPP designs*
- *International PSA Review Team (IPSART)* – Review of Probabilistic Safety Analysis
- *Review of Accident Management Programme and Emergency Operating Procedures (RAMP)*
- *Periodic Safety Review (PSR)* – Review of a Member States approach to the periodic review of safety.
- Supported by SARRP – a tool to assist in the review of safety analysis reports

Safety Assessment Advisory Programme (SAAP)

New DSARS Module for Newcomers

To complement its service, the DSARS now contains a *new advisory for NPP newcomers* with the objective of providing advice on the preparation of key components needed for safety assessment of nuclear power plants.

The Safety Assessment Advisory Programme is now available upon request to assist newcomers in developing their safety assessment infrastructure for independent risk-informed decision-making.

Safety Assessment Advisory Programme (SAAP)

SAAP Overview

The objective of the Safety Assessment Advisory Programme (SAAP) is to advise on the systematic identification of nuclear safety assessment competency and capacity needs for establishing a nuclear power plant (NPP) programme and to support the development of an action plan for competency and capacity building based on the Safety Assessment Education and Training (SAET) Programme.

The SAAP aims to actively engage the recipient Member State in the process of identifying the needs and establishing a safety assessment capacity building programme.

PHASE ONE - Introduction to safety assessment and screening of initial situation in the country

Objective: to familiarize the management of all organizations involved in the new nuclear power programme with the basic concepts of safety assessment and to support them in identifying the specific needs of their organization in this area (one week workshop).

PHASE TWO - Translating identified national safety assessment priorities into a comprehensive competency building programme

Based on the results of the 1st phase - aims at developing a detailed nuclear safety assessment competency and capacity map for the beneficiary Member State as well as a capacity building action plan based on the SAET Syllabus (2-3 weeks jointly with MS).

Safety Assessment Advisory Programme (SAAP)

The SAAP :

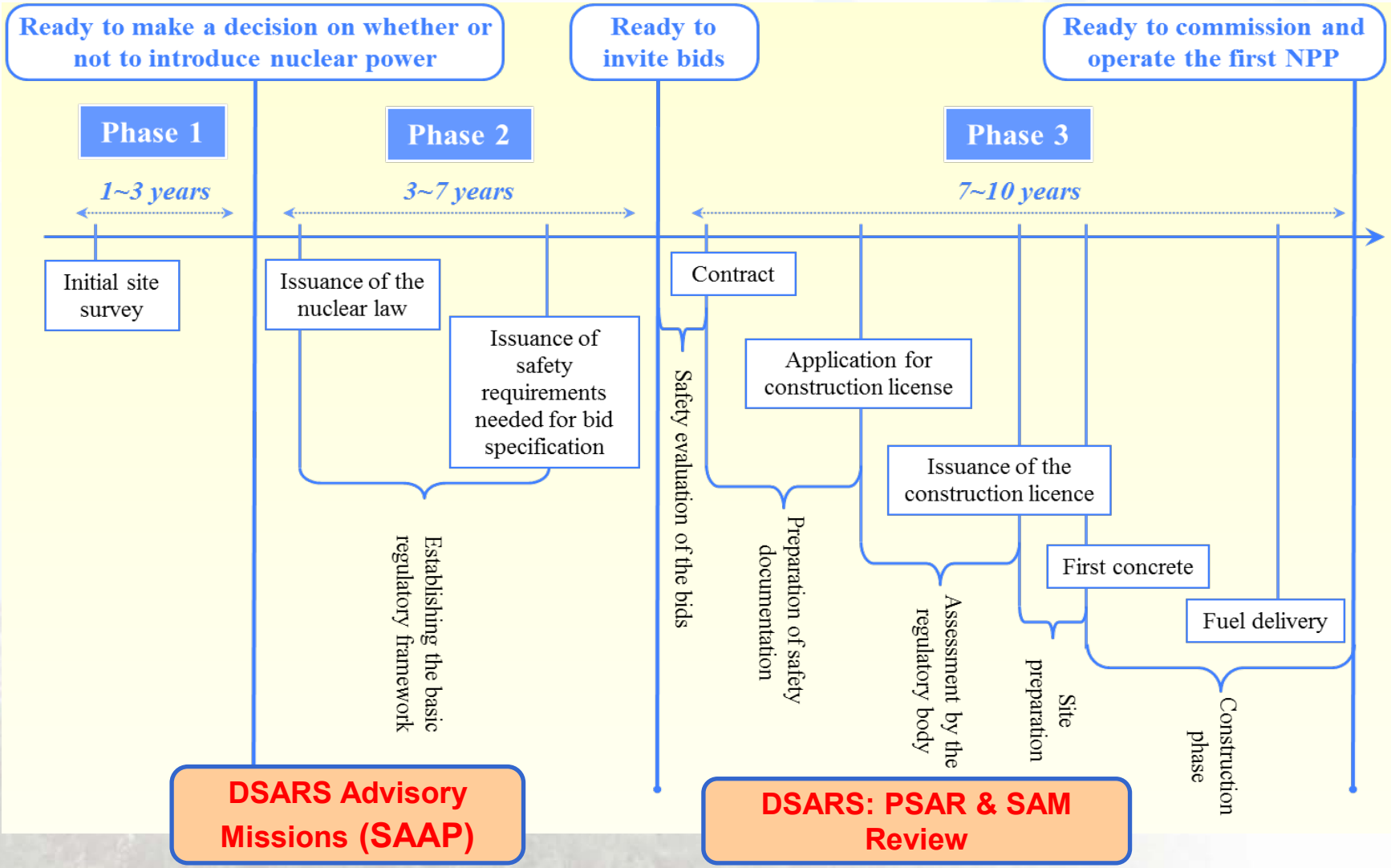
- Is a service tailored to MS needs in safety assessment
- Helps to prepare newcomers for performance/review of safety documentation
- Was developed for countries at Phase 1 and 2 of the milestone approach
- Is structured to address the needs of all stakeholders
- Is conducted by a team of senior international experts
- Can be requested through the Safety Assessment Section of NSNI.

Safety Assessment Advisory Programme (SAAP)

All SAAP advisory and competency building activities are based on :

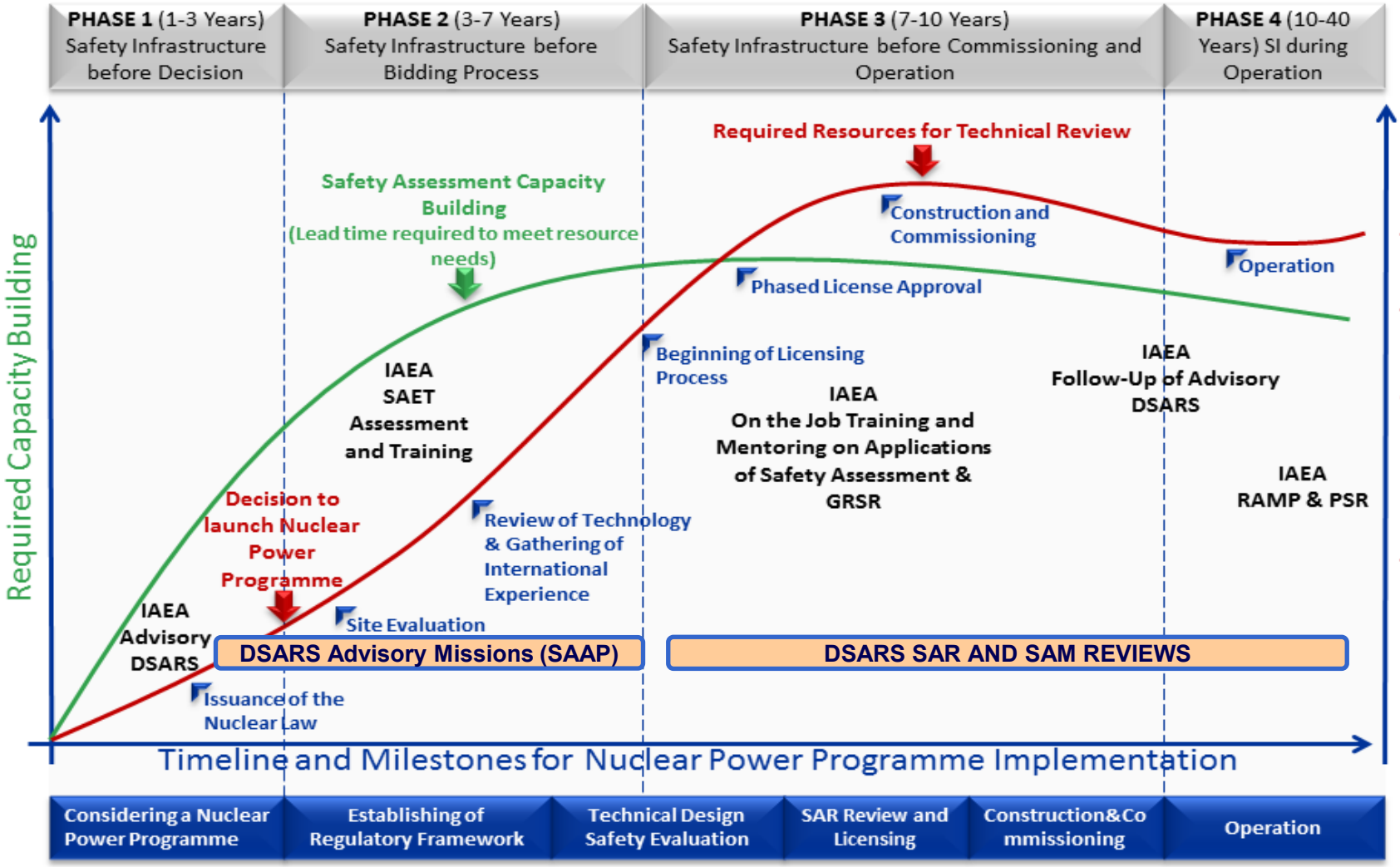
- The IAEA Safety Requirements for Design Safety (SSR 2/1) and for Safety Assessment (GSR Part 4) and related Safety Guides;
- The Safety Assessment Competency Evaluation Methodology : “Establishing the Competence Needs for Safety Assessment Within an Organization”
- The Safety Assessment Education and Training Programme (SAET)

DSARS Safety Assessment Advisory Programme (SAAP) and the Milestones (cont'd)



Essential Safety Assessment Capacity building for Technical Review Requirements

For Regulatory Body (w. SSG-16 Phases)

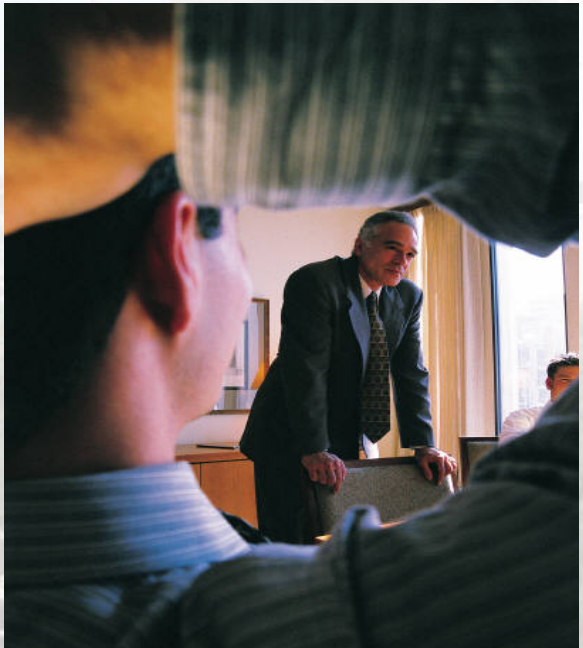


Safety Assessment Advisory Programme (SAAP)

PHASE ONE Introduction to safety assessment and screening of initial situation in the country

OBJECTIVE

The objective of this Phase is to familiarize the Government and other stakeholders of a national nuclear programme with the key components needed for safety assessment of nuclear power plants and to evaluate the availability of these components in the country. The objective should be achieved in a three-day mission to the country.



SAAP Phase 1 is for Officials and Managers

- **Government NPP Decision-Makers**
- **Regulatory Bodies**
- **Future Owner/Operators**
- **Research Institutes/Future TSOs**

Safety Assessment Advisory Programme (SAAP)

PHASE ONE APPROACH

- Presentations on main components needed for development of an independent capability to perform or review safety assessment.
- Examples of feasible solutions adopted in selected Member States.
- Initial screening of the situation in the country using a brief questionnaire.

Safety Assessment Advisory Programme (SAAP)

PHASE ONE CONTENT OUTLINE:

- Introduction of the SAAP objectives and stages
- Key safety assessment topics
- Preliminary screening of availability in the country of key components for safety assessment of nuclear power plants

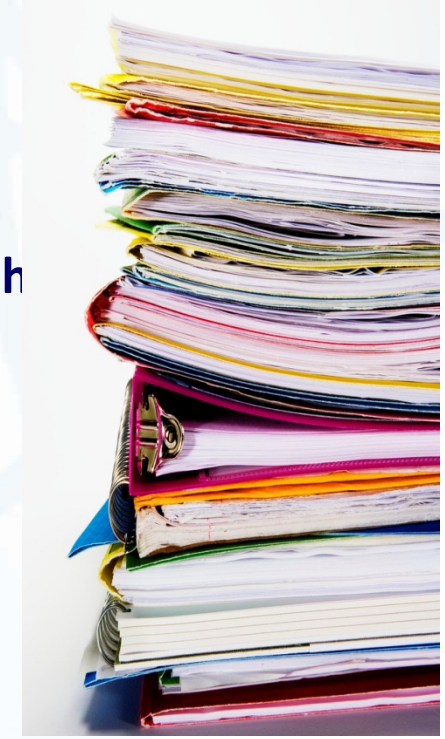
Safety Assessment Advisory Programme (SAAP)

PHASE ONE CONTENT (Cont'd) :

- **Key safety assessment topics covered include:**
  - Safety functions, defence in depth, the role of safety assessment
  - Stakeholders and their respective roles in safety assessment
  - Hierarchy of national legislation and international safety requirements and guidance documents
  - Key documents relevant for safety assessment to be developed for implementation of a NPP
  - Reactor types, design safety features and their importance for adaptation to local conditions
  - Human resources and tools for safety assessment/safety analysis
  - Role and structuring of external technical support and research in the area of safety assessment
  - IAEA Safety Standards and development of national legislation and guidance documents

Safety Assessment Advisory Programme (SAAP)

PHASE ONE CONTENT (Cont'd):



- **Preliminary screening of availability in the country of key components for safety assessment of nuclear power plants**
  - **An informal joint question and answer session with each stakeholder will be conducted to gain comprehensive information of the safety assessment capacities and competencies within their organizations**
    - ✓ **A short questionnaire will be sent to the stakeholder before this session to facilitate the flow of information**
  - **A profile with then be developed by the expert and preliminary suggestions on how to deal with gaps and what types of actions may be needed will be discussed.**

Safety Assessment Advisory Programme (SAAP)

PHASE TWO Translating identified national safety assessment priorities into a comprehensive competency building programme

OBJECTIVE

The objective of this Phase is to jointly plan with the Government and other NPP stakeholders capacity building of key components and high priority areas needed for safety assessment of nuclear power plants in preparation for the bidding and licensing process. The objective should be achieved in and an initial 5 day mission and subsequent missions and consultancies for programme development and implementation.

SAAP Phase 2 is for all Stakeholders involved in the development of a National Nuclear Power Programme

Safety Assessment Advisory Programme (SAAP)

PHASE TWO APPROACH AND CONTENT:

- Presentations on evaluation of safety assessment competency, and the Safety Assessment Education and Training Programme (SAET);
- Application of the Joint or Self-Evaluation Methodology for Safety Assessment Competency : "Establishing the Competence Needs for Safety Assessment Within an Organization"
- Development of a tailored national SAET programme in safety assessment for all stakeholders.
- Presentations on safety assessment methods related to the bidding and SAR evaluation processes.

Safety Assessment Advisory Programme (SAAP)

SAAP MISSION TEAMS are

- Composed of senior international safety assessment experts
- With multi-stakeholder experience
- Familiar with newcomer needs and competency building in safety assessment
- With extensive national and international experience in
  - All phases of development of a Nuclear Power Programme;
  - Technical preparation for licensing and commissioning;
  - Regulatory review of safety analysis in design documents;
  - Owner-Operator preparation for performance of safety analysis;
  - Bidding specifications – review of safety areas
  - Technical support and research

DSARS in the Licensing and Commissioning Process (Phase 3)

DSARS MODULES AVAILABLE FOR ASSISTANCE WITH REVIEW OF DESIGN AND SAFETY ASSESSMENT DOCUMENTS:

- **Design Safety Review (DSR) /Generic Reactor Safety Review (GRSR) against IAEA Safety Requirements - focussing on evaluation of selected sections of the PSAR or FSAR**
- **Review of Accident Management Programme and Emergency Operating Procedures (RAMP) – focussing on evaluation of severe accident management provisions**

POST- PHASE 3 MODULES WHICH CAN BE REQUESTED:

- **International Probabilistic Safety Assessment Review Team (IPSART) – focussing on evaluation of PSA documentation**
- **Periodic Safety Review – focussing on evaluation of periodic safety reviews by Member States.**

DSARS Safety Assessment Advisory Programme (SAAP) and the Milestones

	Phase 1	Phase 2	Phase 3					
					Pre-construction	Pre-commissioning	Pre-Operations	Operations
Project Vendor Constructor	Initial Site Survey		Contract	Preparation of safety documentation (PSAR)		Construction	Commission	
Owner-Operator				Preparation of safety documentation (PSAR)	Application for Construction	Application for Commissioning	Application for Operation	
Regulatory Body		Issue Nuclear Law Issue Safety Requirements			Regulatory review Construction licence	Regulatory review Commissioning licence	Regulatory review. Operating licence	Operational licence
Competencies	SAET	SAET	SAET	SAET	SAET			
		SARRP	SARRP	SARRP	SARRP	SARRP	SARRP	SARRP
Reviews	SAAP	SAAP						
		DSARS safety requirements review GRSR		GRSR	DSAR IPSART RAMP			DSR IPSART PSR
	INIR1	INIR2	INIR3				Pre-OSART	OSART

DSARS Advisory Missions (SAAP)

DSARS: PSAR & RAMP Review

DSARS in the Licensing and Commissioning Process (Phase 3)

SUMMARY

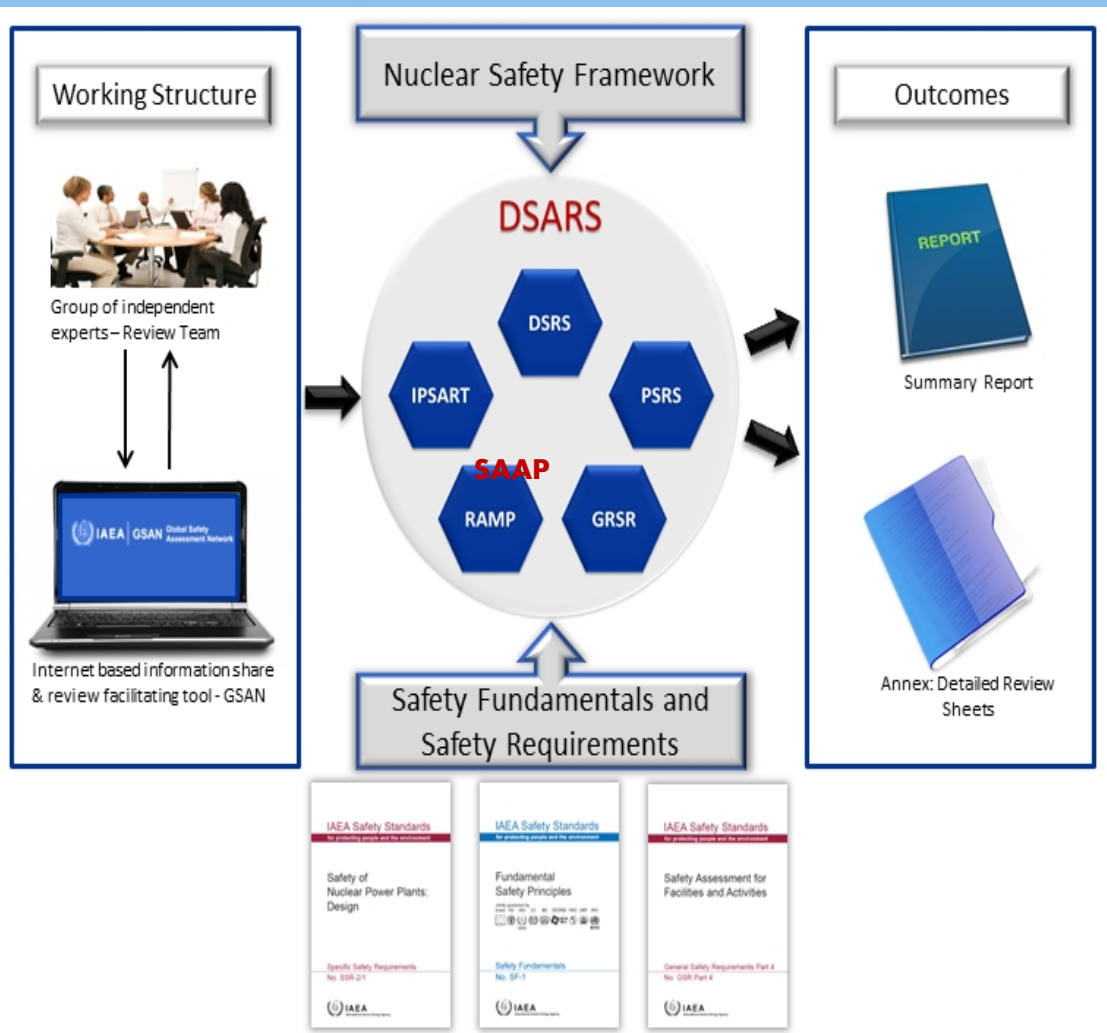
- The DSARS provides a comprehensive set of reviews to assist and advise Member States in achieving and maintaining a high level of safety of nuclear power plants;

- Its new Safety Assessment Advisory Programme will assist NPP newcomer countries in building the capacity and competency needed for successful independent risk-informed decision-making;

Delivery mechanisms for DSARS tailored modules:

TC Projects
Extra Budgetary Programmes
Safety Networks/Forums (GNSSN, ANSN, RCF, GSAN etc.)


IPSART
DSR
PSR
RAMP
GRSR
SAAP


Working Structure
Group of independent experts – Review Team
IAEA GSAN Global Safety Assessment Network
Internet based information share & review facilitating tool - GSAN
Nuclear Safety Framework
DSARS
DSRS
IPSART
PSRS
SAAP
RAMP
GRSR
Safety Fundamentals and Safety Requirements
IAEA Safety Standards
Safety of Nuclear Power Plants: Design
IAEA Safety Standards
Fundamental Safety Principles
IAEA Safety Standards
Safety Assessment for Facilities and Activities
Outcomes
REPORT
Summary Report
Annex: Detailed Review Sheets

Thank you