



IAEA

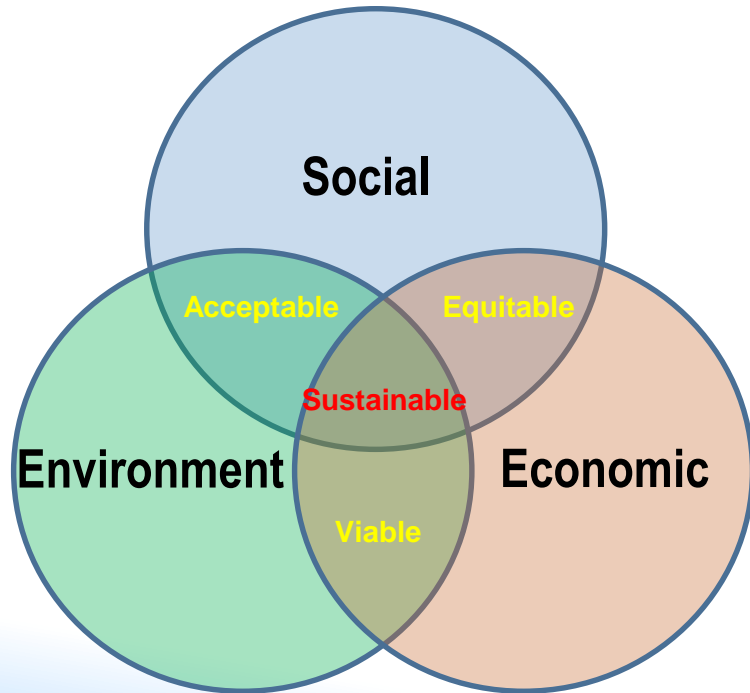
International Atomic Energy Agency
Atoms for Peace and Development

IAEA's Assistance in Addressing Safety Challenges in Developing Infrastructure for Nuclear Installations

**The Global Nuclear Safety and Security Network
Plenary Meeting, 18 September 2019**

**Greg Rzenkowski, Director
Division of Nuclear Installation Safety
Department of Nuclear Safety and Security**

Nuclear Power Development: General Considerations



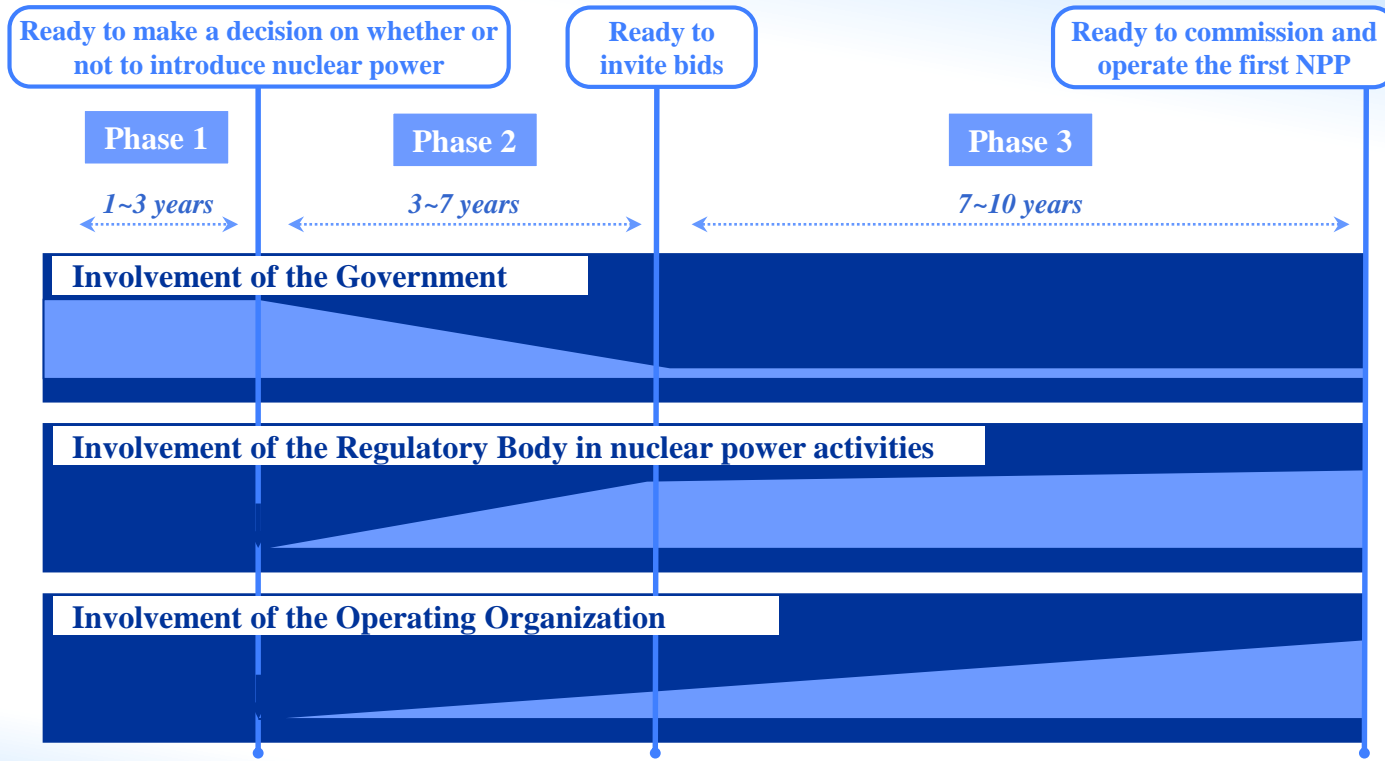
Long-term government commitment

- National infrastructure
- Qualified/skilled human resources
- High up-front investment
- Public acceptance

Global impact

- High level of safety and security
- Control of nuclear materials
- Long-term waste management

Programme Development: Phased Approach



Safety Essentials and Key Challenges

Without Safety no Nuclear Power Programme will be Successful or Sustainable



National commitment

- Safety is a **national responsibility** and cannot be outsourced
- Safety is an integral component in **all infrastructure issues**

Regulatory effectiveness

- Appropriate regulatory control over facilities and activities
- Openness and transparency

Safety of nuclear installations

- Adherence to up-to-date safety standards
- Adequate demonstration of safety
- Effective **safety culture** derived from good **leadership**

Globalization of nuclear safety

- Strengthening Global Nuclear Safety Regime

Safety Infrastructure: IAEA Assistance

IAEA Activities

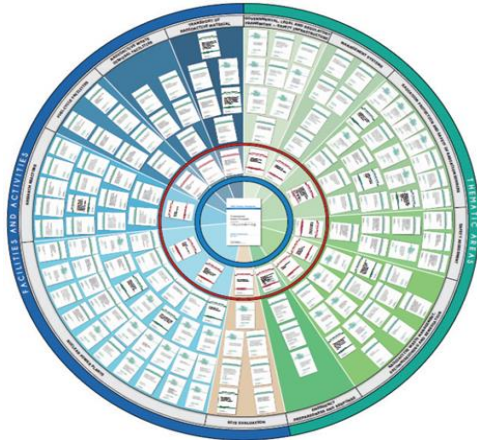
- Safety Standards
- Safety Reviews Services
- Capacity Building



- Nuclear Power Plants
- Research Reactors
- Fuel Cycle Facilities

- Provide for **implementation of legal instruments**
- Develop **internationally recognized** safety standards
 - Safety fundamentals, requirements and guides
 - Guidance on establishing safety infrastructure
- Provide for **implementation of safety standards**
 - Safety reviews services
- Provide quality **support and assistance** to Member States developing safety infrastructure
 - Capacity building (training courses, workshops, fellowships and scientific visits)
- Facilitate exchange of **regulatory and operating experience**
- Coordinate and collaborate effectively with other organizations
- Facilitate **stakeholders engagement**, communication and public understanding

IAEA Safety Standards: General



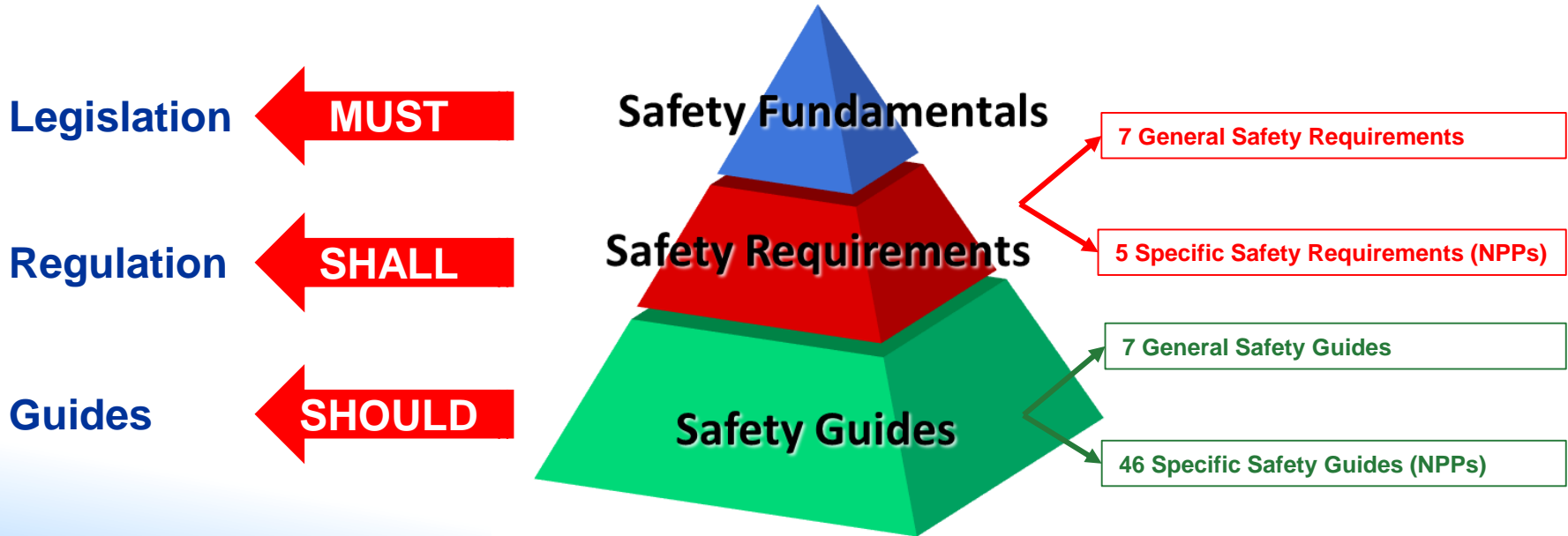
- **Application of Safety Standards by Member States**
 - Represent the **consensus of Member States**
 - Used as reference for national arrangements
- **Safety Standards are binding**
 - For **IAEA's own activities**; and
 - Where Member States request **assistance from the IAEA** or States enter into **project agreements** with IAEA
- **Safety Standards are periodically reviewed**
 - Reflect experience in their use and evolving knowledge
- **The General Conference and the Convention on Nuclear Safety**
 - **encourage Member States to use the IAEA Safety Standards** in their national regulatory programmes



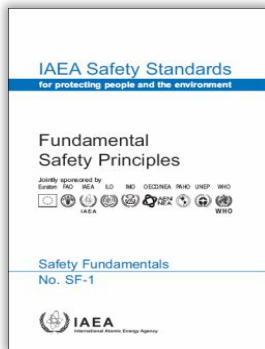
IAEA Safety Standards: Application

National Framework

IAEA Safety Standards



Fundamental Safety Principles



Ten safety principles form basis on which safety requirements are developed and safety measures are implemented to achieve the primary safety objective

The fundamental safety objective

To protect people and the environment from harmful effects of ionizing radiation

Principle 2: Role of Government

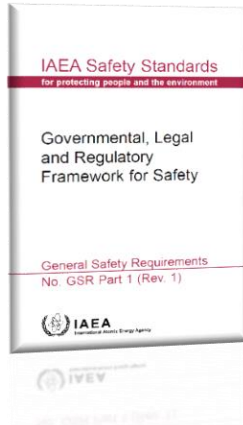
An effective legal and governmental framework for safety, including an independent regulatory body, must be established and sustained

The Regulatory Body

- Adequate legal authority
- Effectively independent and free from any undue pressure from interested parties
- Able to inform the public and other interested parties about the safety aspects of facilities and activities and about regulatory processes
- Consult the public and other interested parties in an open and inclusive process

General Safety Requirements

GSR Part 1: Governmental, Legal and Regulatory Framework for Safety



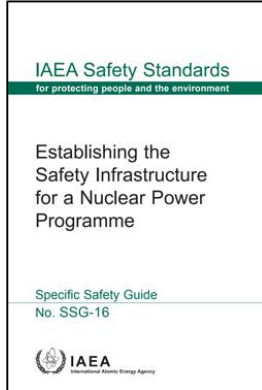
- Fundamental requirements for development of safety framework
- Criteria for self-assessment of completeness and adequacy of safety infrastructure
- Rev. 1 published in February 2016

Supporting Safety Guides

- **SSG-16:** Establishing the Safety Infrastructure for a Nuclear Power Programme
- **SSG-12:** Licensing Process for Nuclear Installations
- **GSG-12:** Organization, Management and Staffing of a Regulatory Body for Safety
- **GSG-13:** Functions and Processes of the Regulatory Body for Safety

Specific Safety Guide: Infrastructure Development

SSG-16: Establishing the Safety Infrastructure for a Nuclear Power Programme

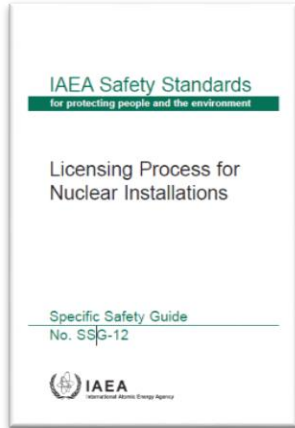


- 20 elements of the safety infrastructure supported through 200 actions
- Each element based on IAEA safety standards
 - GSR Part 1 for elements 1-7 and 20
 - GSR Part 2 for elements 9-10
 - GSR Part 3 to 7
 - SSR-1, SSR-2, SSR-5 and SSR-6 for other elements

20 elements
1. National policy and strategy for safety
2. Global nuclear safety regime
3. Legal framework
4. Regulatory framework
5. Transparency and openness
6. Funding and financing
7. External support organizations and contractors
8. Leadership and management for safety
9. Human resources development
10. Research for safety and regulatory purposes
11. Radiation protection
12. Safety assessment
13. Safety of radioactive waste management, spent fuel management and decommissioning
14. Emergency preparedness and response
15. Operating organization
16. Site survey, site selection and evaluation
17. Design safety
18. Preparation for commissioning
19. Transport safety
20. Interfaces with nuclear security

Specific Safety Guide: Licensing Process

SSG-12: Licensing Process for Nuclear Installations



General recommendations

- Basic Licensing Principles
- Obligations, Roles and Responsibilities of the Regulatory Body
- Obligations, Roles and Responsibilities of the Applicant or Licensee
- Main contents of a license
- Public Participation
- Graded approach

Steps of the Licensing Process

- Siting and site evaluation
- Design
- Construction
- Commissioning
- Operation
- Decommissioning
- Release from Regulatory Control

Siting and Site
Evaluation

Design

Construction

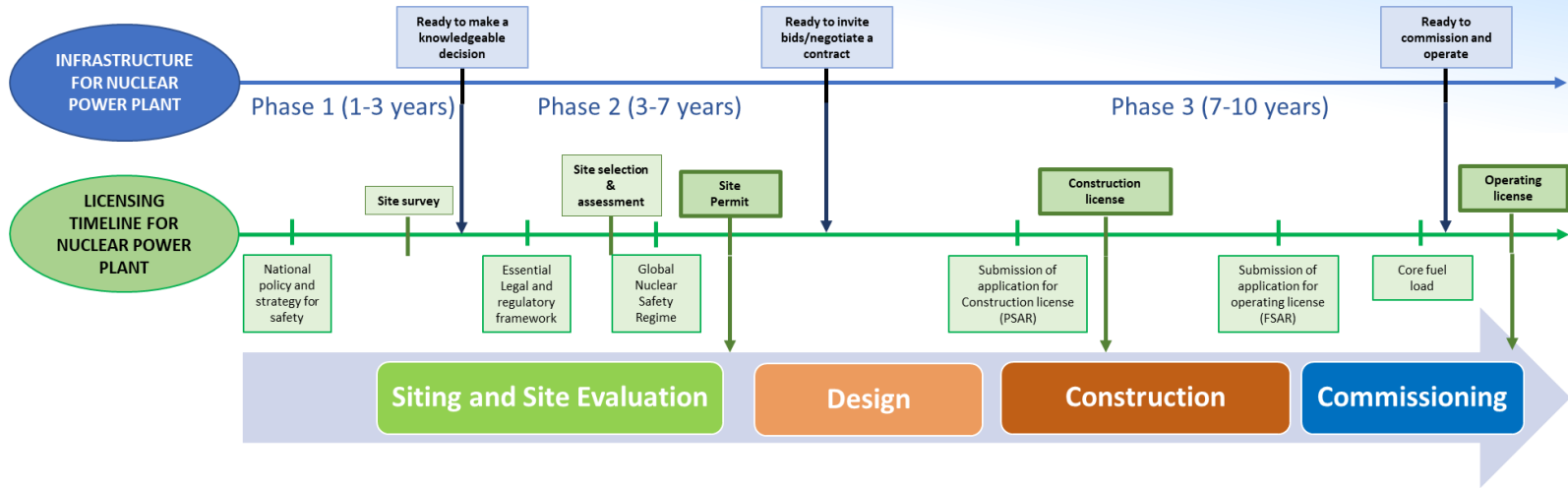
Commissioning

Operation

Decommissioning

Release from
Regulatory
Control

Safety Review Services for New Entrants



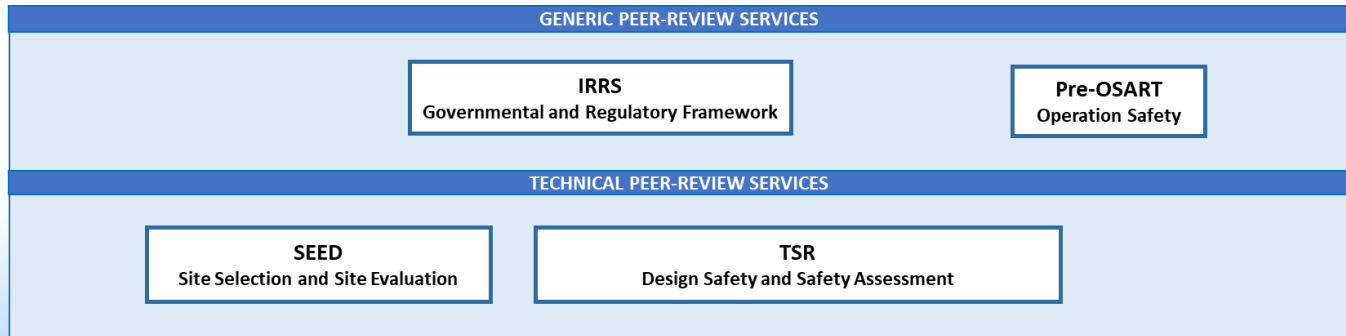
Review Safety Services

IRRS: Regulatory Framework

Pre-OSART: Operational Safety

SEED: Site Selection and Evaluation

TSR: Technical Safety Review



Building Human Capital



Leadership and Management for Safety

CAPACITY BUILDING



Human Resource Development

Education and Training

Knowledge Management

Knowledge Networks



Build



Capacity

Competence

Knowledge

Information

Data

Infrastructure Elements

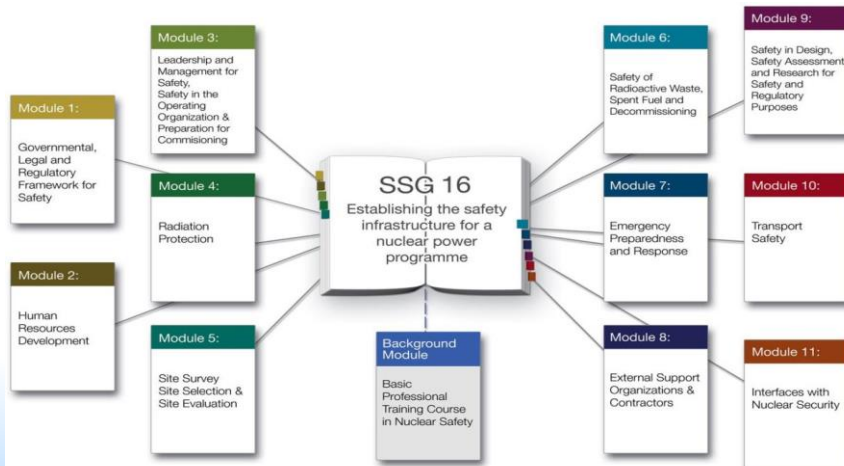
Activities:
A means to meet the objectives

Objectives:
“What the Safety Standards ask for”

Capacity Building: New Entrants

Education and Training

SSG-16 training organized in 11 thematic modules covering the 200 safety actions



Strategy

Member States' taking ownership of developing and implementing a national strategy

Objective

- Sustainability of national programs
- Train the trainers
- Self-learning and training courses

Scope

- Safety infrastructure for nuclear power program

Infrastructure Development: Progress Monitoring

Siting and Site Evaluation

Design

Construction

Commissioning

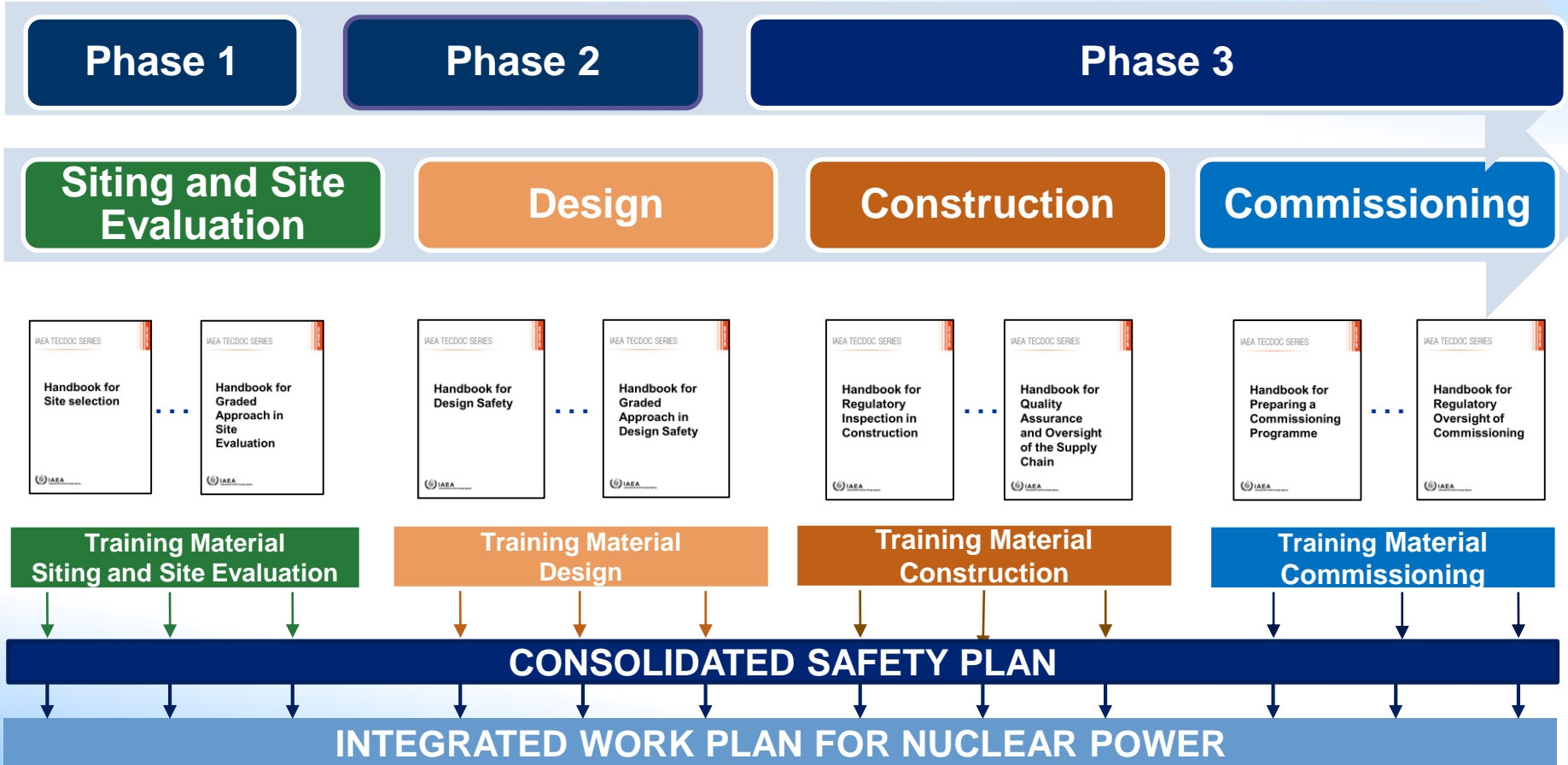


Phase 1

Phase 2

Phase 3

Capacity for Action: Holistic Approach



Overall Summary

- A nuclear power programme is a **major undertaking** that requires careful planning, preparation and investment
 - **Safety is the national responsibility** and cannot be outsourced
 - Safety is an integral component in **all infrastructure issues** and should be considered in early stages of a nuclear power programme development
- IAEA provides assistance with **safety infrastructure development**
 - ✓ Assisting in implementation of legal instruments
 - ✓ Publishing international recognized standards and providing for their implementation
 - ✓ Facilitating international collaboration to strengthen safety
 - ✓ Fostering exchange of experience among regulators
 - ✓ Supporting embarking Member States in a systematic and coordinated manner
- **Measurable achievement** in strengthening nuclear safety and enhancing regulatory effectiveness globally
 - ✓ More than 100 IRRS missions conducted since 2006
 - ✓ Pre-OSART missions help with assuring operational readiness
 - ✓ High level of implementation of recommendations and suggestions