



IAEA

60 Years

Atoms for Peace and Development

Overview of the IAEA's Technical Cooperation Programme

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May 2019

Outline of Presentation

1. IAEA's statutory mandate for Technical Cooperation (TC)

1. TC framework: key policy documents

- Resources (financial and human)
- Financial resource management
- TC assistance in NPP area

2. TC project RER2015 – NPPs Operation Safety (for LTO of NPPs)

Three pillars” of the IAEA



**Safeguards
&
Verification**

**Safety
&
Security**

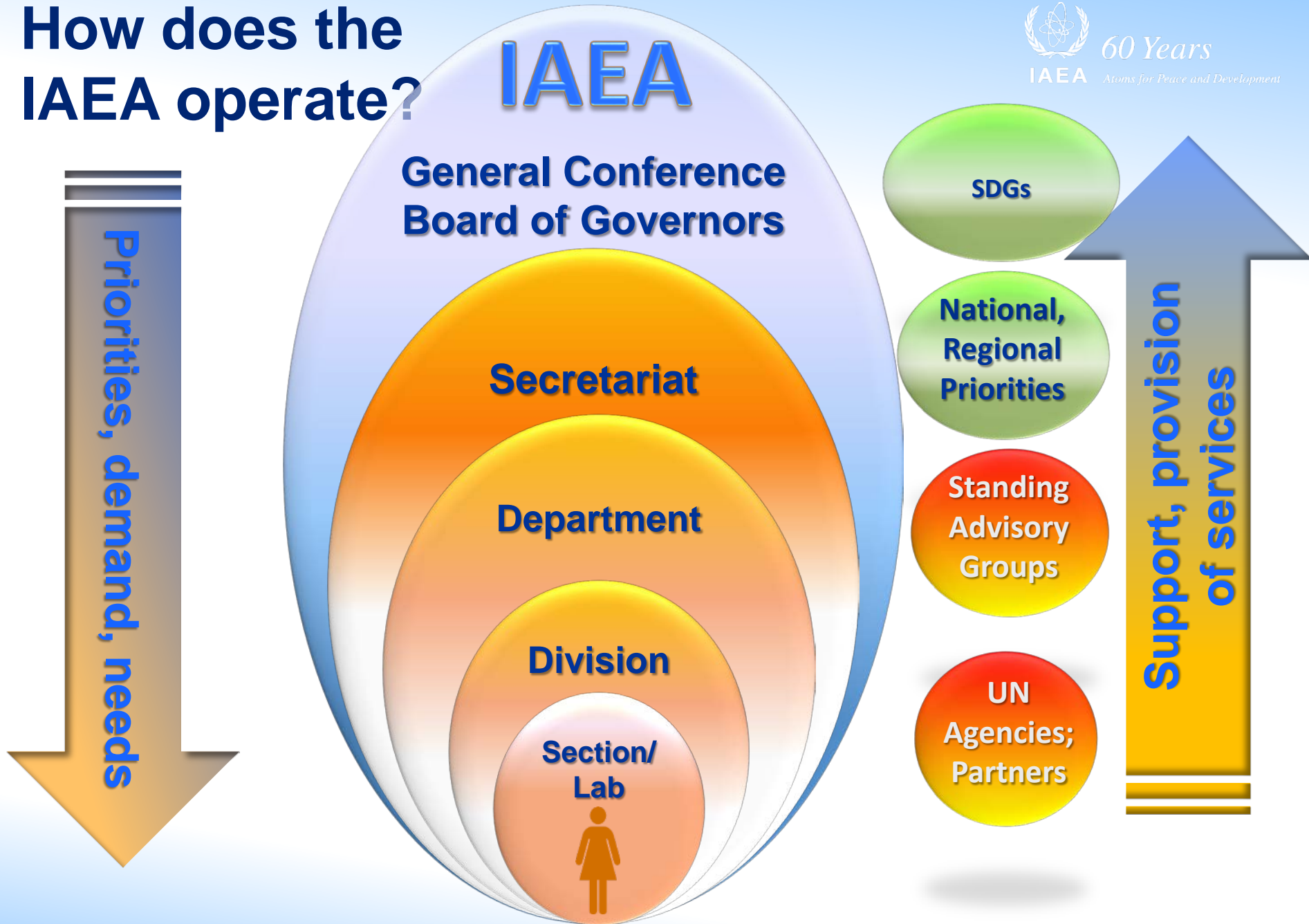
**Science
&
Technology**

Agency's Technical Assistance

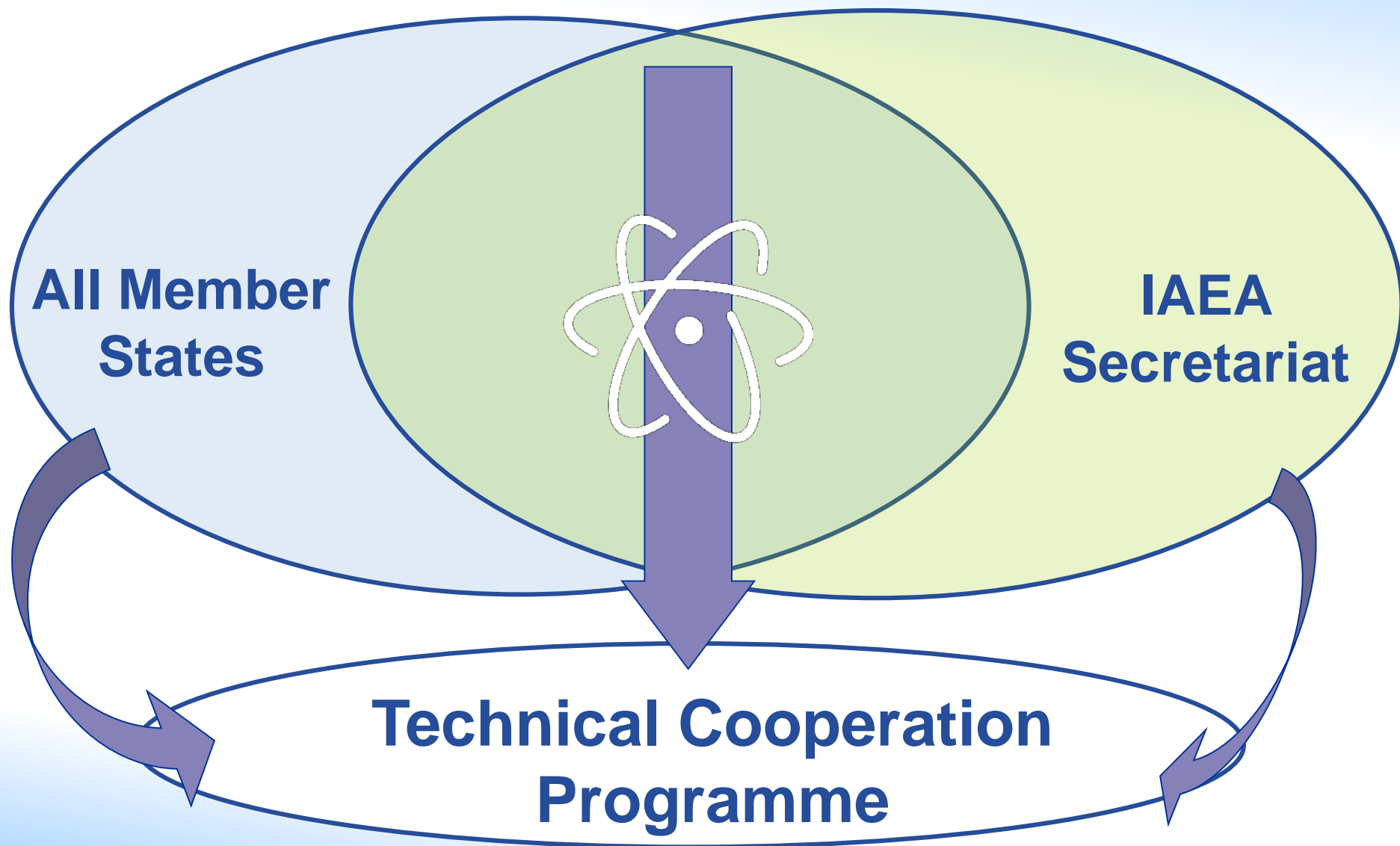
- **Regular Programme**
 - Developed and implemented by the Technical Departments
 - Issue standards and guides
 - Validate nuclear techniques (CRPs)
 - Advisory service and review missions
 - Funded from regular budget and extra-budgetary
- **TC Programme**
 - Managed from Regular Budget (MP6 No programmatic activities)
 - Managed by TC Department
 - Funded from TCF and EBT
 - Supported by all Departments
 - Developed jointly with Member States

Complement each other

How does the IAEA operate?



Technical Cooperation: A shared responsibility



TC Programme Features

- Responds to Member States' needs and results based/oriented
- Jointly developed with Member States
- Flexibility –accommodates emerging needs and emergencies
- Projects can be approved beyond the biennium
- Dynamic project workplan
- Financed from different sources
- Contributes to development goals
- Transparency



Key principles for the TC programme

- Contributes to development goals
- Responding to Member States' needs
- Peaceful use undertaking
- Safety and security
- Member State ownership and shared responsibility
- Non-discrimination
- Cooperation among Member States and with partners
- Transparency

TC facts and figures

- TC Department: ~225 staff
- 170 Member States – all, in principle, eligible for TC support
- 146 countries and territories participate in the TC programme
- 37 LDC recipient countries
- 80% of recipients are non-nuclear power countries
- No field presence

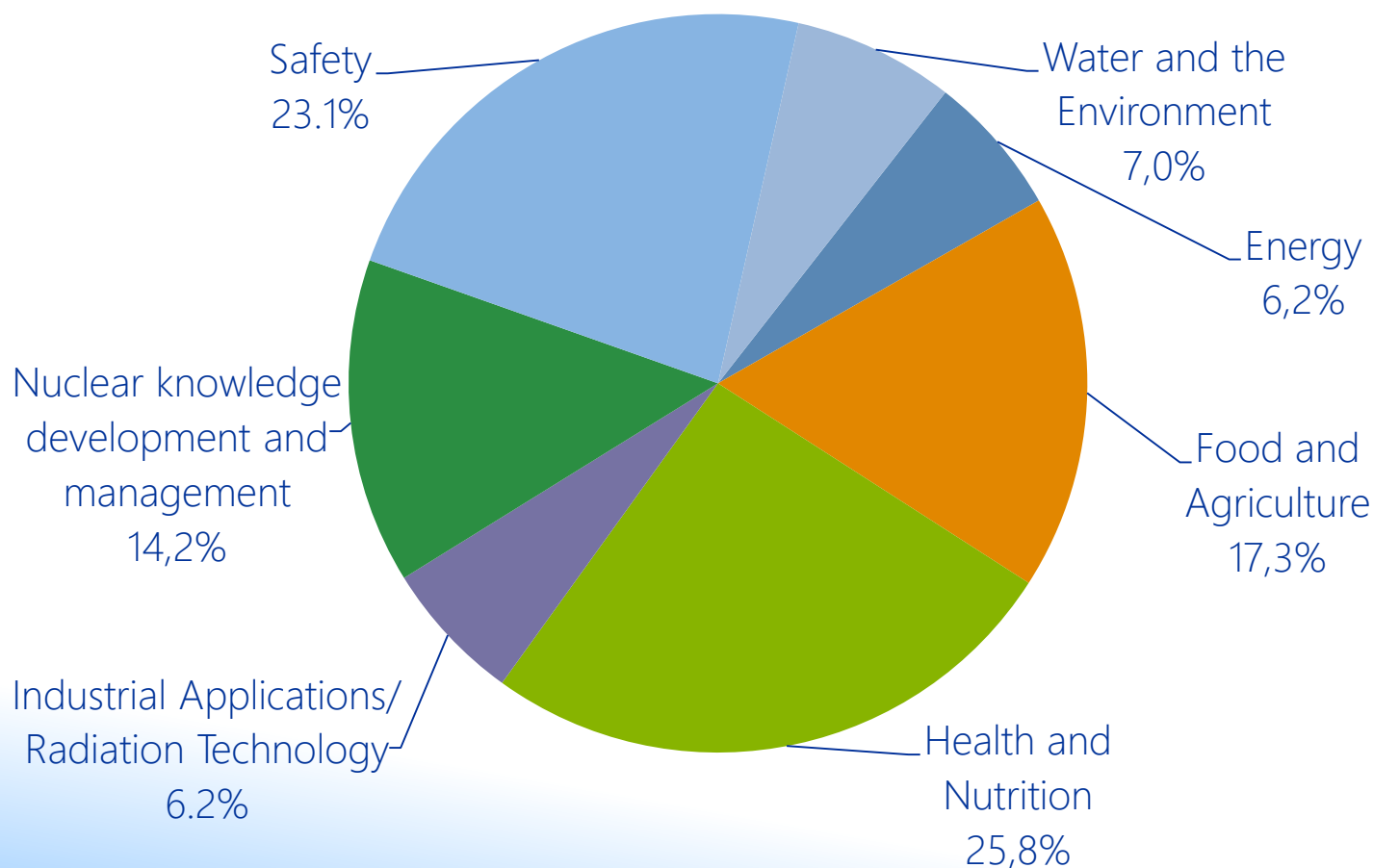
We work in four regions



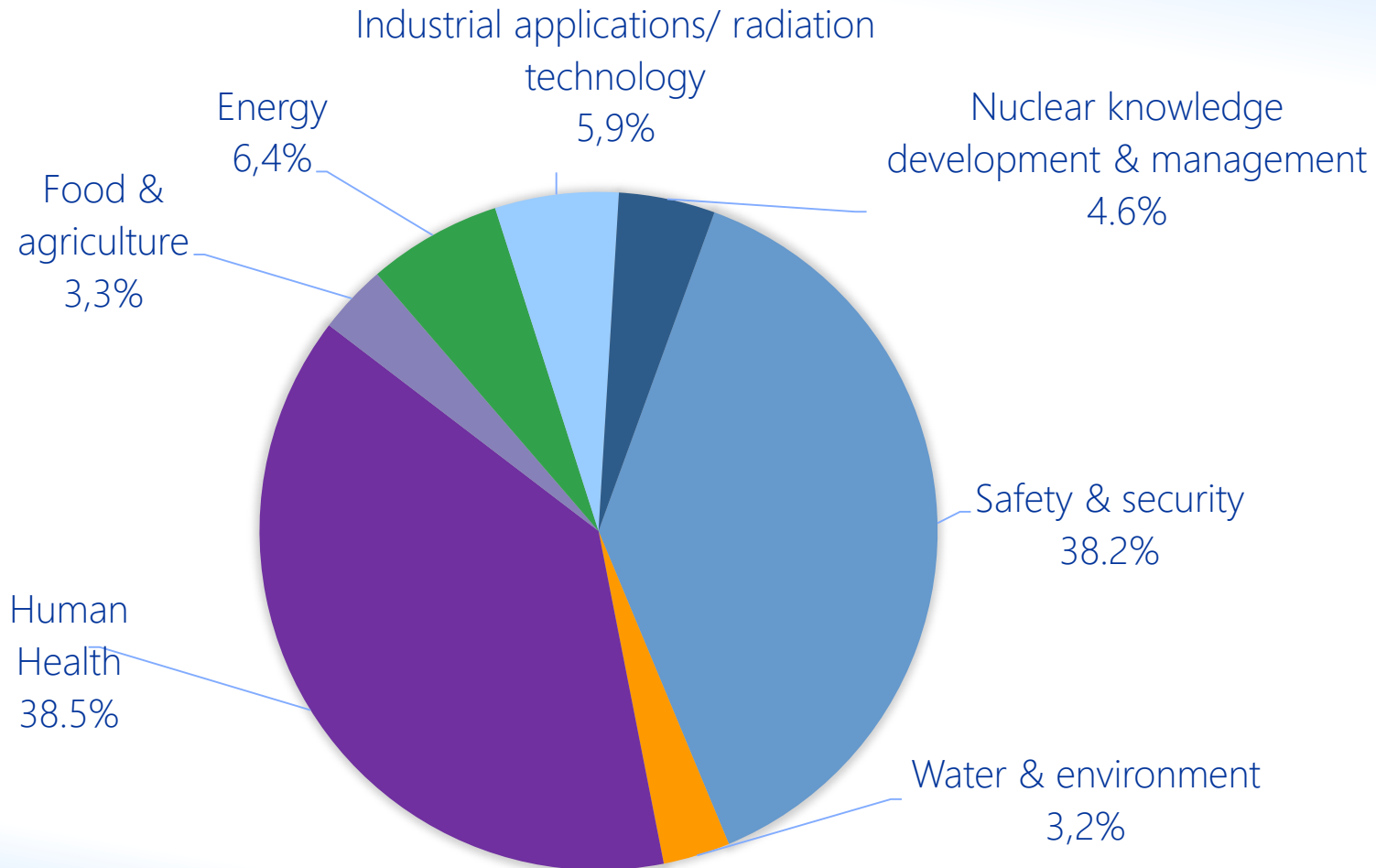
Overall TC Programme Areas

2018-19 TC programme

about €85 million/year from TC Fund



Europe and Central Asia' budget about 25M Euro for 2018-19: Core programme



TC Delivery Mechanisms

National

- Infrastructure building
- Address country's specific needs
- About 60-65% of the programme
- 141 MSs with national designs for 2020-2021 TCP

Regional

- Networking and experience sharing
- Address issues of common interest and issues of regional dimension

Interregional

- Networking and experience sharing
- Address issues of common interest to the four regions

Types of support

- ❑ Expert advice
- ❑ Fellowships, Scientific Visits
- ❑ Workshops, training courses
- ❑ Equipment and materials





Capacity Building

- Training courses & workshops/meeting
- Fellowships
- Scientific visits
- Expert missions

Procurement

- Radiotherapy machines
- Gamma irradiators
- Accelerators : E-beam, ion-beam
- Reactor vessel

Safety and Security

- Strengthening regulatory safety infrastructure
- Legal issues

Technical cooperation programme (TCP):

Areas of activity



Health & Nutrition



Food & Agriculture



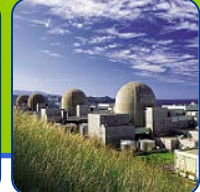
Water & Environment



Radiation Technology



Energy



Safety and Security



Knowledge Management



2018-2019 TC Program: National projects



Member States and Territories with national TC programme	136
Project concepts received	871
Projects proposed for approval by BoG	579

2018-2019 TC Program: Regional and Inter-regional projects

4 regions have regional projects	About 156
Inter-regional projects	About 15

Member States Europe & Central Asia



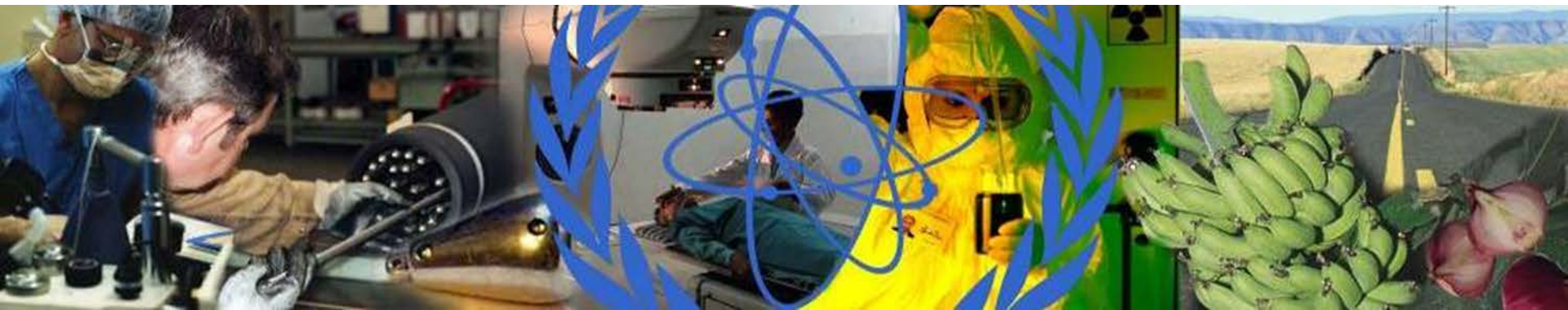
- MSs with TC national programmes: 29
- MSs participating in TC regional programme only: 4
- Others

TCEU Reginal Current Cycle Portfolio of Projects: 2018-2019

115 TCEU projects:

87 National projects

28 Regional projects



TCEU Future Portfolio of Projects (2020-2021...)

TCEU projects:

~ **100** National projects

~ **27** Regional projects

NPPs Operation Safety Project

- **RER2015** - Strengthening Nuclear Power Plant Lifetime Management for Long Term Operation (LTO)
- **Objective:** To enhance the NPP safety level for extended operation and with respect to international practice through exchanging experiences gained by the operating organizations in the Europe Region in performing studies to justify the safe and long term operation of NPP and by the regulatory authorities to license the LTO.

Continue

- **Specific problems:** connected with LTO, such as maintenance effectiveness monitoring, ageing management, time limited ageing analysis management processes, and others. A number of important issues were covered in the frame of previous IAEA regional projects on LTO, such as: methodologies and techniques on online monitoring of equipment performance (maintenance and qualification); approaches in the field of passive components resource evaluation and strength analysis; and regulatory requirements to LTO.
 - Mainly focused on operating countries for improvement of plant performance and enhancement of safety
 - TCEU MSs - nine countries
 - TCF

Main Data

- **Project duration: 4 years as of 2018**
- **Field of Activity: 06 - Nuclear power reactors**
- **Total approved budget: EUR 900,375.00**
- **10 TCEU participating Member States:**
 - **Armenia, Bulgaria, Czech Republic, Hungary, Russian Federation, Slovakia, Ukraine, Slovenia, Romania, (Uzbekistan)**
- **Main focus on operating countries for improvement of plant performance and enhancement of safety.**
 - **Support outside EU countries based on request**



60 Years

IAEA

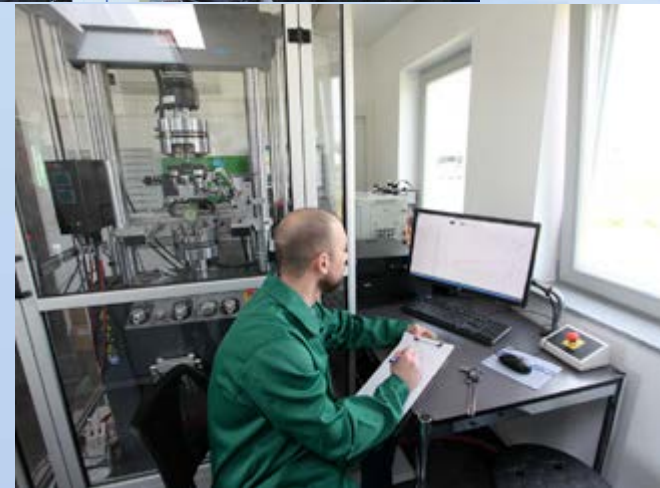
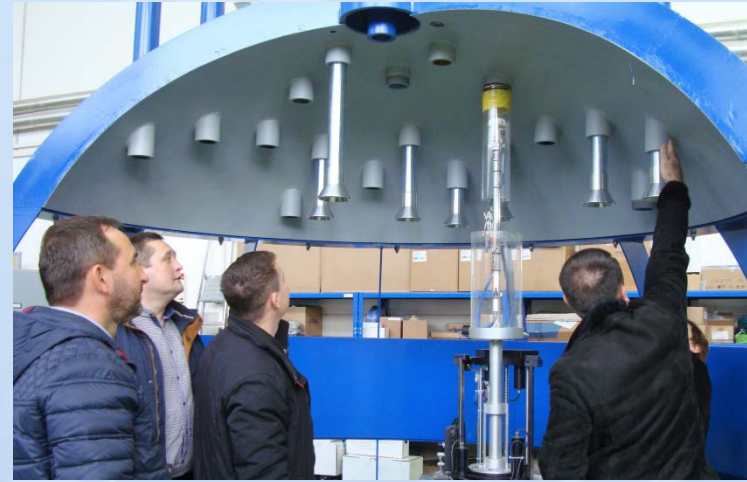
Atoms for Peace and Development

Completed training courses in 2018

April 2018:

Training Course on the Advanced On-line Monitoring Methodology to Predict the Residual Life Time of Critical Structures, Systems and Components through Experimental Approach

Germany



WSs/Meetings in 2018

- **March:** Workshop on Strengthening Capabilities for Nuclear Power Plant Safety, Performance and Life Service

Qinshan-II 4 x 650 MWe PWR

Qinshan 2 x 650 MWe Candu



Qinshan 1 x 330 MWe

- **July:**
 - Support management system attendance from TECU.



WSs/Meetings in 2018

- **September:** Wworkshop on Technical challenges in the application and licensing of digital I&C systems
 - *Digital I&C modernization and licensing practices*
- **September:** Workshop on plant life management for long term operation
 - *Economics of long term operation and implementation for 10 – 20 Years extension*
- **November:** Workshop on Equipment Qualification issues in frame of LTO (Seismic impacts and harsh environment conditions)
 - *Harsh environment in LOCA condition and Equipment survivability*



Workshop/meetings in 2019

1	Regional Workshop on the Economic Feasibility and Improving Effectiveness of Assets for Nuclear Power Plant One-Time or Consecutive Long Term Operations	Zagreb, CRO	7-9 May
2	Regional Workshop on Equipment Qualification for long term operation of nuclear power plant	CZR	20-24 May
3	Regional Workshop on maintenance optimization for improvement of safety and performance	??	8-12 July
4	Regional workshop on Knowledge management and human resource development programme for long term operation in NPPs	ROM or BUL ??	August
5	Regional workshop on Advanced I&C applicaton and licensing process	HUN ??	16-20 September
6	Regional workshop to define the root cause of Materila degradation such as stress corrosion cracking, fatigue and radiation embrittlement	GFR ??	14-18 October

Training Courses in 2019


1	Group Scientific Visit on Strengthening Capabilities for Nuclear Power Plant Safety, Performance and Service Life, Learning from the Experience of China	Beijing, CPR	22-26 April
2	Group scientific visit to learn knowldege preservation and transfer, HRD programme for long term operation, Learning from the Experience of RoC	Gyeong Ju, ROC	5-9 August

Activities in 2020

- A workshop on Long Term Operation of NPPs and Global Platform for Nuclear Supply Chain
- Other TBD

Brief Introduction of Global Platform for Nuclear Supply Chain

(website: www.hweall.com)



The screenshot displays the website's navigation and content structure. At the top, the HWEALL logo and name are on the left, and a search bar with the text '全部商品分类' and '请输入要搜索的关键词...' is on the right. Below this is a dark blue navigation bar with links for '全部商品分类', '主页', '关于我们', '行业资讯', '知识共享', '会员服务', and '联系我们'. A left sidebar lists product categories: '泵类', '阀门', '容器/换热器', '电气设备', '仪控设备', '空调/通风设备', '管道/支承件/连接件', '三废处理/过滤设备', and '其他'. The main content area features a large image of a nuclear reactor core, a '欢迎光临' (Welcome) message with '会员注册' and '会员登录' buttons, and a '消息通告' (News) section with several announcements. Below the main content are four service tiles: '核设备复检服务' (Nuclear Equipment Re-inspection Service), '设备核升级服务 CGD' (Equipment Nuclear Upgrade Service CGD), '设备代理 市场开发' (Equipment Agency Market Development), and '技术咨询与服务' (Technical Consultation and Service). At the bottom, a '整机展示' (Complete Machine Display) section shows various pieces of nuclear equipment, with a filter bar above it listing '泵类', '阀门', '电气设备', and '仪控设备'.

Objective of Platform to be established:

(1) Global nuclear Equipment Database

- To collect the Equipment and Component data provided by suppliers.
- To form a global nuclear equipment and component database by storing the data in a certain structure.

(2) Global nuclear supply capability Database

- To collect the capability and performance data provided by suppliers.
- To form a global supplier's capability and performance database by storing the data in a certain structure

(3) Procurement Platform for utilities

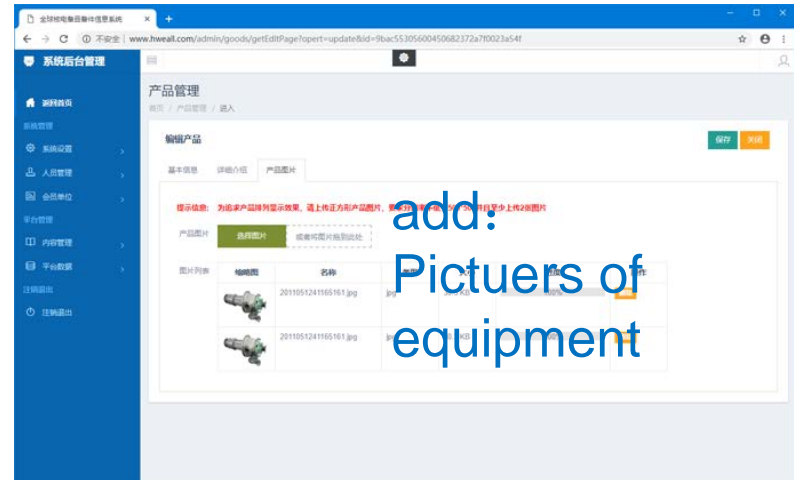
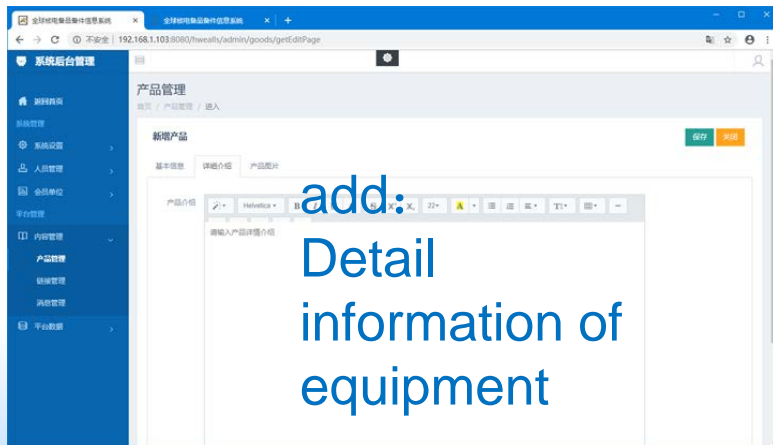
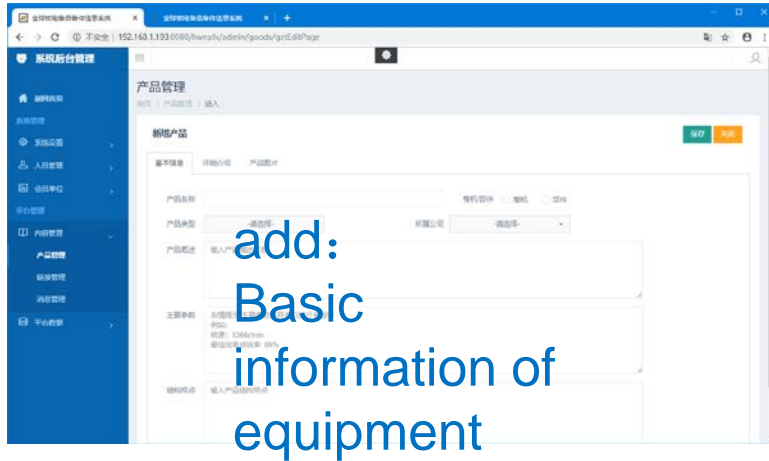
- Utilities can find the most suitable products by searching the names of the equipment and components.
- Utilities can find the most capable suppliers by searching and comparing suppliers' capability and performance.

(4) Exchange Platform between utilities and suppliers

- Utilities can release the purchase demands and capable suppliers contact them actively.
- Utilities contact directly the capable supplier found out on the platform.

Adding Equipment information by suppliers

Registered Supplier can add its equipment to database by itself.



Adding capability and historical performance by suppliers

Registered Supplier can add its capability and performances to database by itself.

The screenshot shows a web application interface for managing suppliers. On the left is a blue sidebar with navigation options: 系统后台管, 返回首页, 系统管理, 系统设置, 人员管理, 会员单位, 会员单位 (highlighted), 平台管理, 内容管理, 平台数据, 注销退出, and 注销退出. The main content area is titled '会员单位' and '会员单位 / 编辑'. It features a '进入' button and a '保存' button. The '单位名称' field contains 'Shanghai kaiquan Pump Corporation'. The '单位介绍' field is a rich text editor with a toolbar and contains the following text: 'Founded in 1995', '5 production bases', 'Manufacture shop 300,000m²', 'Employees 5200', 'Annual sales over 3 billion CNY, 300,000 sets of equipment', 'ISO9001', 'Quality Management System', 'ISO 14001', 'Environmental Management System', 'GB/T28001-2001', 'Occupational Health and Safety', 'Quality Assurance Program for Nuclear Safety Class Pumps', 'The Management Procedures: 25', 'The Technical Procedures: 93', 'Specific QAP and Procedures for the project', 'In 2012, License for Design and Manufacture of nuclear safety equipment (Class 2&3 pumps) issued by NNSA.', and '3 R&D laboratories'.

False information prevention mechanism

1.Review of supplier's information

Operating Organization of platform review supplier information and authorize the supplier different level rights of uploading information.

2.Review of equipment information added by supplier

Operating Organization of platform review the equipment information and decide if the information could be showed to the visitors of platform

Function of searching

Two types of searching tool

1. Searching by Navigation Bar

2. Searching by Inputting key words



Display of searching results



产品明细 >> 核电站松脱和振动件故障监测系统 (KIR)



核电站松脱和振动件故障监测系统 (KIR)

☆☆☆☆☆ 0 用户关注 | 0 专家观点

主要参数

抗误报警功能
对连续背景噪音以及持续时间 $t_l < 1ms$ 或 $t_l > 100ms$ 的干扰信号, 当峰值达到通道的允许最大动态范围时, 不产生“事件”触发; 在环境劣于以上情况时, 通过软件报警逻辑避免误报警。

诊断功能
a. 可实时监测核反应堆和蒸汽发生器的松脱件和脱落件;
b. 具有良好的松脱件事件检测能力;
c. 具有良好的抗误报警能力;
d. 性质分析: 可判决脱落件、松脱件或振动件;
e. 定位功能: 在监测区间安装3个传感器和信噪比; $S/N \geq 3$ 的情况下, 松脱件定位误差不超过 $0.8m$; 当 $S/N < 3$ 或松脱件质量较大 ($> 5kg$) 时可给出误差发生的区域;
f. 质量估计: 当 $S/N \geq 4$ 时, 质量估计误差一般不超过 40% ; 极端情况下不超过一倍。

- 节约降低成本
- 解决采购难题
- 支撑采购计划
- 保障服务品质

Key parameters

Picture of equipment

Basic information
Features
Introduction of Supplier
Related documents

产品说明	市场应用
结构特点	作为该系统设备的国内唯一供货商, 核动力院可提供包括系统设计供货、系统改进、故障诊断分析专家技术支持以及技能培训等全方位的服务。
厂商介绍	系统的设备供货
相关资料	2006年-2007年承担了包括秦山二期扩建工程和岭澳核电二期工程松脱部件及振动监测系统共4个机组的供货项目, 并于2010年设备正常投运, 使用情况良好; 2009年以来, 又陆续承担了红沿河、宁德、阳江和防城港KIR系统16个机组以及福清、方家山4个机组的设备供货项目, 正在生产制造过程中。2011年4月完成红沿河、宁德2个机组的设备交付。
产品标签	松脱部件监测评定的技术服务 2005年至2006年承担并完成了田湾核电站松脱部件及振动监测系统现场调试的技术支持; 为田湾核电现场调试期间的报警事件多次提供专家诊断分析的技术支持和技术服务。 使用与维护人员培训 为秦山核电站相关专业技术人员进行培训; 为大亚湾核电站相关专业技术人员进行培训。

Prospect for Platform

1. To release the English version next week.
2. To improve the interface of platform.
3. To invite more suppliers to provide data by every efforts.
4. To cooperate with worldwide organizations to expand influence and application of platform.
5. To develop the Database of Equipment Quality on Block Chain based technology in next several months.

Looking forward to cooperation with and share to all people and organizations FREE.

Contact person: wangzhongtang@hweall.com

Q and A ?



Technical
Cooperation
Programme

*Technical cooperation:
delivering results for
peace and
development*



Operating Nuclear Power Plants

Tech. Area

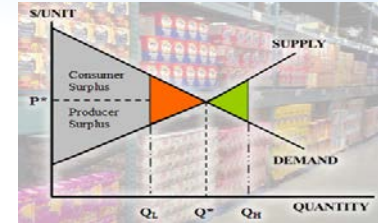
- Reactor core Management
- Plant Life Management for long term operation
- Operation and Maintenance programmes
- Thermal performance monitoring and optimization
- System upgrade and Modernization
- Performance monitoring and organization improvement
- Equipment Reliability
- Surveillance Test or In-service Test through Advanced



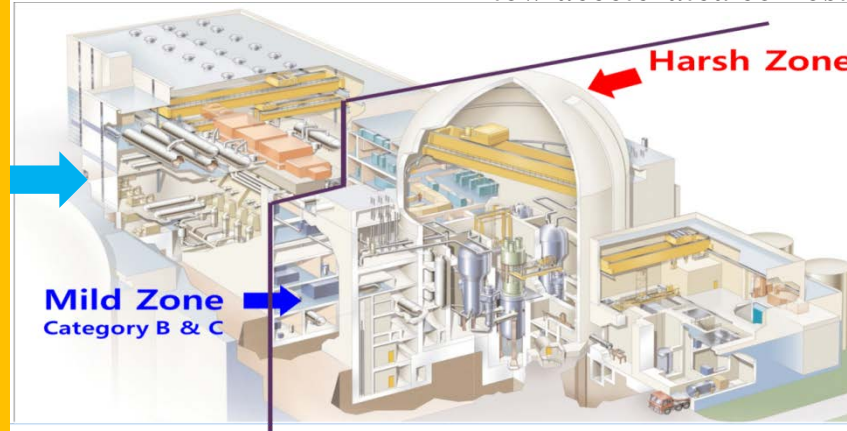
HFE



Flow accelerated corrosion



Flexible operation



Thermal Performance monitoring

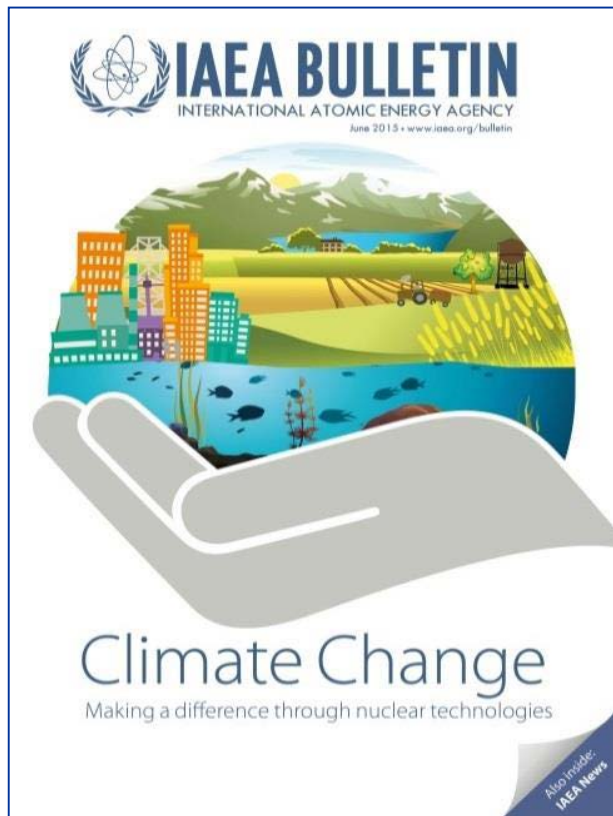


Inventory Control Management



Asset management

Role of Nuclear and Climate Change



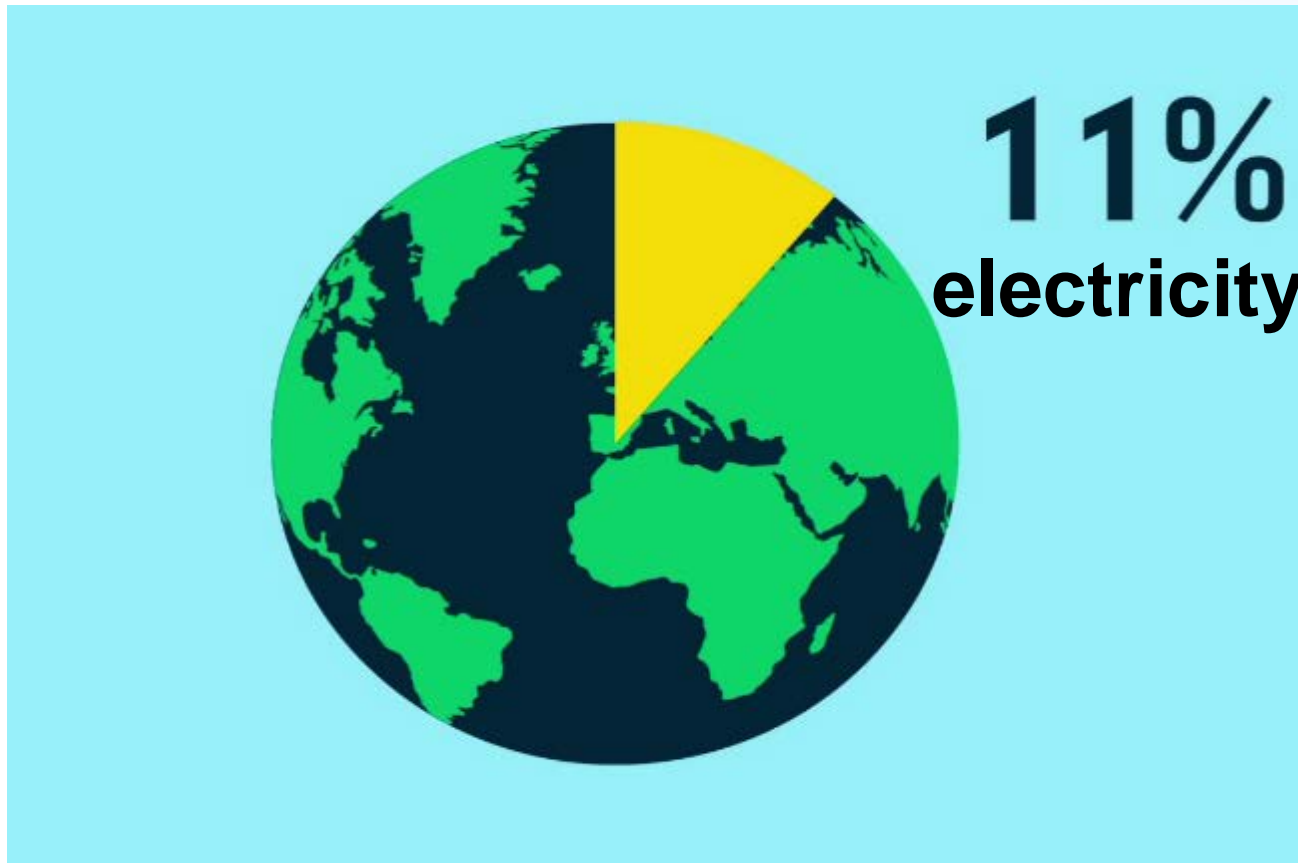
Need to anchor nuclear as a core asset to meet 2°C goal and SDGs

How NPPs can support Climate Change ?

- Low-carbon electricity available today in large capacities.
- 11% of the world's electricity but actually 1/3 of the low-carbon electricity.
- Energy security

We shall do much more...

Nuclear power



NP Reactors

(as of 31st March 2019)

449 in operation



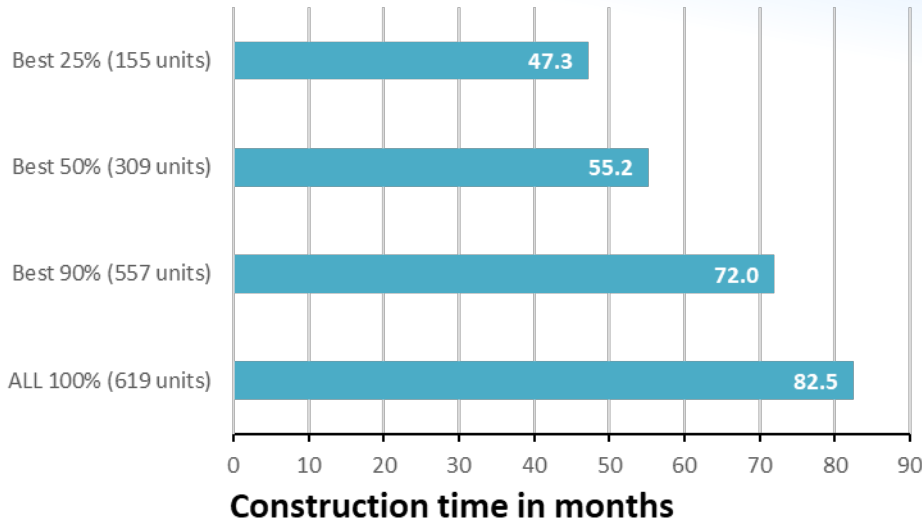
396 GW(e) Capacity



55 under construction (2/3 in Asia)



Lessons Learned from Nuclear Power Plants Build Projects

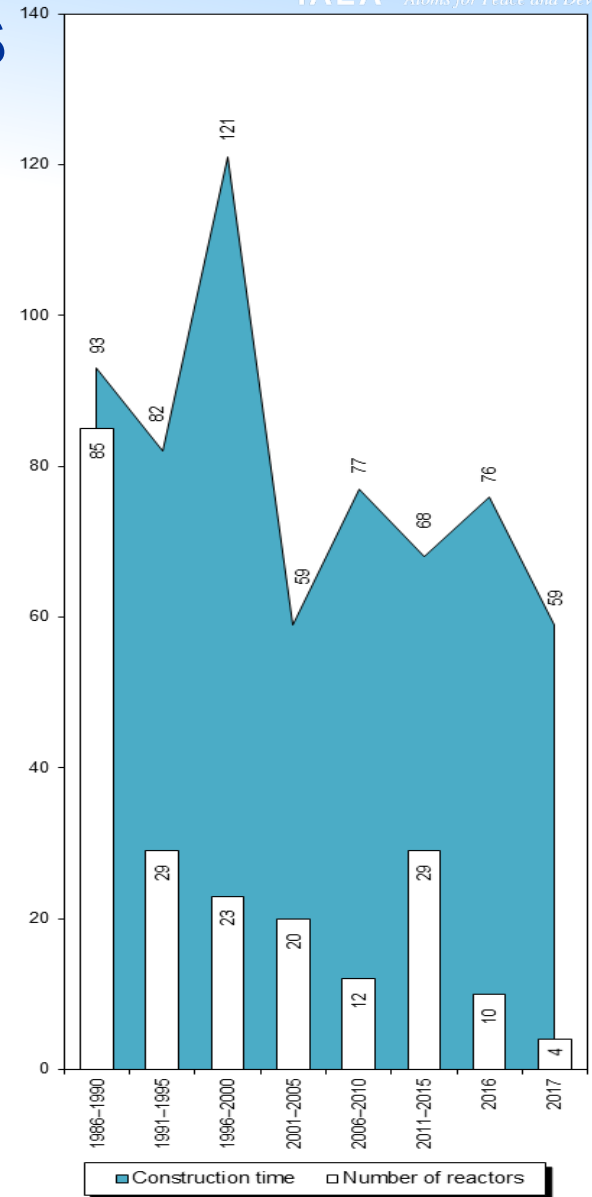


- Construction time have shortened
- Historical average is 83 months
- Best 50% were build in 55 months

But, among 57 reactors currently under construction, 23 are above 83 months.

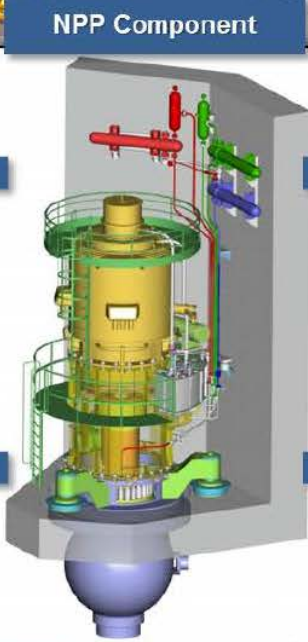
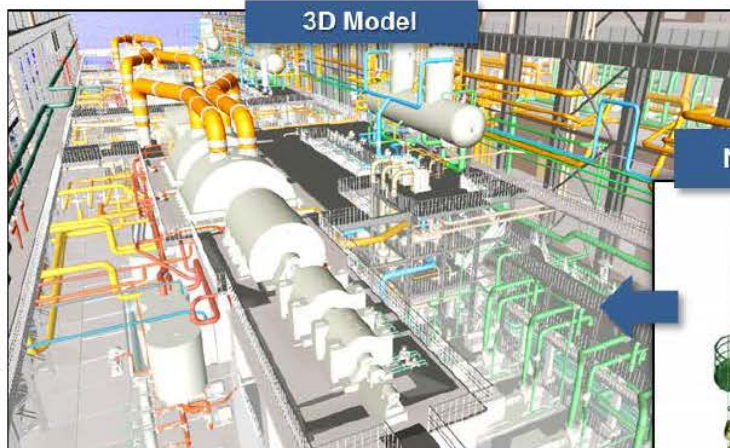
- FOAKs
- Complexity
- Industrial abilities

And total cost of construction increased a lot



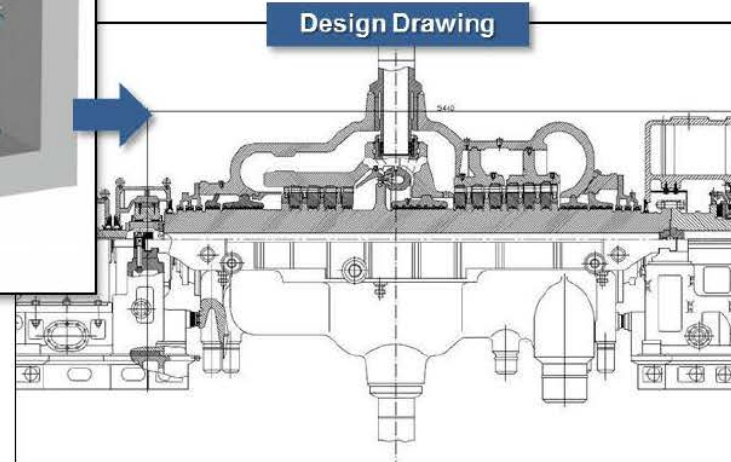
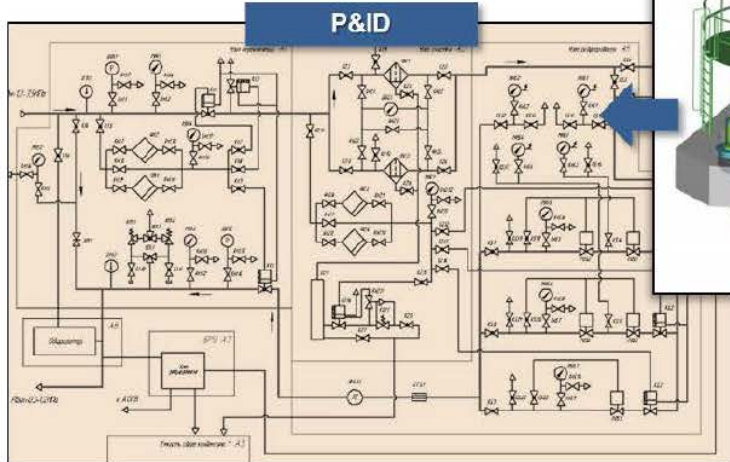
Median of construction time in months

Information System for Engineering Data Management, based on 3D models



Tabula Data
(weights, dimensions, dose rates etc.)

Наименование и техническая характеристика	Тип (марка)	Площадь поверхности ед-цы	Масса ед-цы	Количество	площадь поверхности	Общая масса
Аварийный насос уплотнений вала генератора Q=38 м ³ /час, N=26.4 кВт	ЦНМА 38-176	8.15 м ²	630 кг	1 шт.	8,1 м ²	630,0 кг
Аварийный питательный насос Q=65	ПЗА 65-56	14.21 м ²	3540 кг	1 шт.	14,2 м ²	3540,0 кг
подпиточный насос Q=46	ЭП-50	28.93 м ²	5010 кг	2 шт.	57,9 м ²	10020,0 кг
В F=200 м ² , V=4.3 м ³	ПСЗ-200-7-15	72.36 м ²	6810 кг	1 шт.	72,4 м ²	6810,0 кг
В F=125 м ² , V=2.26 м ³	ПСЗ-125-7-15	57.82 м ²	4240 кг	1 шт.	57,8 м ²	4240,0 кг
бак	ББВ-2	9.93 м ²	430 кг	1 шт.	9,9 м ²	430,0 кг
Р		1.12 м ²	30.55 кг	1 шт.	1,1 м ²	30,5 кг
Р	ФВ-25	1.44 м ²	39.3 кг	2 шт.	2,9 м ²	78,6 кг
Р	ФС-400-1	10.32 м ²	19.5 кг	3 шт.	31,0 м ²	58,5 кг
Р	ВГТ-2700-500	62.98 м ²	4411.95 кг	1 шт.	63,0 м ²	4412,0 кг
Р	ВТ-50-3000	8.3 м ²	2067.7 кг	1 шт.	8,3 м ²	2067,7 кг
теплого расхода	ТВВ-6-2	105.95 м ²	64300 кг	1 шт.	105,9 м ²	64300,0 кг
	ТВВ-200-2	371.35 м ²	225380 кг	1 шт.	371,4 м ²	225380,0 кг
бак V= 50 м ³		118.98 м ²		1 шт.	119,0 м ²	-
20 м ³	ДСП-1000	483.34 м ²	36590 кг	1 шт.	483,3 м ²	36590,0 кг
карбены		431.8 м ²	260725 кг	1 шт.	431,8 м ²	260725,0 кг



Project Management during Construction

- Competent project management
 - Organization, coordination and control
 - Achieving technical excellence by working to quality standards, optimizing the schedule and the supply chain, and minimizing costs
- Capacity building
 - Human resource development for construction management and technology for a new NPP construction



Looking to the future

- Strengthen engagement with MSs and partners to ensure effective, sustainable and tangible results of TCs work.
- Examine ways and means to render resources for TCF sufficient, assured and predictable.
- Strengthen TCs visibility and awareness of TCs work
- Working with the private sector and non-traditional donors while maintaining IAEA ethics and standards
- Ensuring flexibility to respond to emerging needs
- TC programme and SDGs

Q and A ?



Technical
Cooperation
Programme

*Technical cooperation:
delivering results for
peace and
development*



NPPs projects

- **RER2014:** Facilitating Capacity Building for Small Modular Reactors: Technology Developments, Safety Assessment, Licensing and Utilization **for 2 years.**
- **Objective:** To contribute to a new way how to cover the European demand for clean and emission-free flexible resources of electricity and heat, work in synergy with renewables, and to decrease dependency on fossil fuel imports.

Continue

- **Specific problems:** SMR design and technology development have undergone a rapid advancement in the past decade with interest from both expanding and newcomer countries. There are about 50 design concepts, a few of which are tested, but only three designs are currently under an advanced stage of construction. The designs cover a wide range of types, starting from well-known pressurized water reactors (PWRs), but made smaller and compact to more innovative ones (reactors cooled by liquid metals or salts). These types of reactors are promising from several aspects: Technically, they are not completely new. There is experience in the fields of power technologies, military or space. Emphasis on compactness and long refuelling periods substantially reduces building time at the site and safeguards problems, without the necessity of a substantial further technical development (as e.g. Generation 4 reactors). This technical evolution and smaller size may also reduce the time and effort for safety assessment, and the widely accepted principle of a graded approach may reduce the time to obtain the license. This may be further reduced by building identical units on a greater scale (so far, power reactors are more or less built individually). -----.

Project Facts: RER2014

- **Title:** *Facilitating Capacity Building for Small Modular Reactors: Technology Developments, Safety Assessment, Licensing and Utilization*
- **Budget:** EUR 450,450
 - Approved Budget TCF: EUR 355,950
 - Extrabudgetary contribution (footnote-a/): EUR 94,500
- **Duration:** 2 years (Jan 2018 - Dec 2019)
- **Development Objective:** *To contribute to a new way how to cover the European demand for clean and emission-free flexible resources of electricity and heat, work in synergy with renewables, and to decrease dependency on fossil fuel imports*
- **Outcome:** *Knowledge in all aspects of SMR technology, licensing, safety assessment, economy and implementation increased*
- **Activities: Exchange of experience on all aspects of SMRs including**
 - **Design and technology of water and non-water cooled SMRs;**
 - **Infrastructure, economic and financing aspects of SMRs;**
 - **Non-electric nuclear applications, technology assessments and specific issues on engineering, construction and the industrial supply chain of SMRs;**
 - **Design safety, safety assessment, principles for emergency preparedness and response as well as regulatory framework and licensing issues for SMR development.**
- **Participating Member States:** 16*

*Albania, Armenia, Azerbaijan, Croatia, Czech Republic, Greece, Hungary, Lithuania, Northern Macedonia, Poland, Romania, Russian Federation, Slovak Republic, Tajikistan, Turkey, and Ukraine.

Nuclear Fuel Projects

- **RER2016** - Enhancing the Capabilities in the Diversification of Power Reactor Fuel Supplies for 2 years.
- **Objective:** To enhance capabilities in the safe and efficient use of nuclear power with diversified nuclear fuels sources.

Continue

- **Specific problems:** in accordance with the European Energy Security Strategy May 2014, it is suggested that an overall diversified portfolio of power reactor fuel supply is needed for all plant operators. Some efforts have been made to diversify the nuclear fuel supply, e.g. for Russian pressurized water reactors (VVER). Although it was successfully applied at some nuclear power plants, it was abandoned for different reasons. Such experience needs to be shared for the licensing of new types of fuel assemblies for power reactors among the countries which plan such diversification. These issues need to be addressed because they are related to the implementation and licensing of new fuel assembly types for reactors of various designs identified and analysed. Among all, safety concerns are of high interest and critical importance.

RER2016 Enhancing the Capabilities in the Diversification of Power Reactor Fuel Supplies

Project Budget: EUR 388,500

- TCF: EUR 336,000
- Extrabudgetary contribution (footnote-a/): EUR 52,500

Project Duration: 2 years (Jan 2018 - Dec 2019)

Development Objective: To enhance capabilities in the safe and efficient use of nuclear power with diversified nuclear fuels sources

Project Outcome: Capacity of the participating Member States enhanced through analysis and sharing of issues related to the implementation and licensing of new fuel assembly types for reactors of various designs

Targeted Member States: 10 TCEU MS (ARM, BUL, CZR, HUN, KAZ, ROM, RUS, SLR, TUR, UZB)

RER2016 Enhancing the Capabilities in the Diversification of Power Reactor Fuel Supplies

Activities in 2018

- ❖ Regional coordination meeting (26-27 March 2018, Vienna, Austria)
- ❖ Workshop on Fuel Supply Strategy & Preparation for Request for Proposal & Bid Evaluation (26-27 June 2018, Vienna, Austria)
- ❖ Workshop on Licensing and Operation of Mixed Cores (4-6 Sep 2018, Vienna, Austria)
- ❖ Workshop on Qualification of codes and methods for the analysis of mixed cores using multiple products (11-13 Dec 2018, Vienna, Austria)

Activities in 2019

- ❖ Workshop on safety assessment and independent oversight of mixed core licensing (19-21 June 2019, Vienna, Austria)
- ❖ Workshop on safety assessment of mixed cores using multiple products (France, TBC, Sep 2019)
- ❖ Workshop on impact on fuel diversification on fresh and spent fuel management (TBC, Nov 2019)

Comers through Inter-regional Project: INT2018

- **Title:** Supporting Knowledgeable Decision-making and Building Capacities to Start and Implement Nuclear Power Programmes
- **Objective:** To bring together countries that are considering nuclear power as an option and countries that are actively preparing for the introduction of nuclear power.
 - Support Member States to take knowledgeable decisions to start nuclear power programmes;
 - Support nuclear power capacity building in Member States to develop the necessary competencies and organizations.
- **Duration:** 2016–2019 (4 years)

Continue

- **Specific problems:** this project brings together countries that are considering nuclear power as an option and countries that are actively preparing for the introduction of nuclear power and involves two primary objectives:
 - **Part 1:** Supporting Member States to take knowledgeable decisions to start nuclear power programmes;
 - **Part 2:** Supporting nuclear power capacity building in Member States to develop the necessary competencies and organizations.
 - Mainly support for new comers and expansion countries
 - Funded by USA, Korea and Russia (In case of Russia, only accepted to organize training course at Russia)
 - Events were held in Korea, USA, Russia and Japan etc.
 - All EBP fund, not TCF

2018 Summary of activities

- **Funding sources:** approx. 6.6 million EUR (76% Extrabudgetary Funding / 24% TCF)
- **Participating MSs:** Embarking and Expanding Countries as Determined by NPSG
- 19 activities planned (all implemented)
- 6 additional activities implemented
- 372 participants* trained for 25 activities = average of 15 people / activity
- 25% of participants were women
- 40 external experts contracted from 22 Member States

Continues

- 4 multi-donor training courses implemented (3 in Vienna, 1 in Korea)
- 33 activities planned for 2019

*Note: a few people participated in multiple activities



Project in Uranium Production and Environment: INT2019

Title: Deploying Technology and Management of Sustainable Uranium Extraction Projects

Objective: To implement an effective uranium extraction strategy to meet fuel needs for nuclear power generation.

- More than 45 Member States participate in this projects.
- TCF

Continue

Specific problems: sustainable uranium production is critically important for secure, socially accepted uranium fuel security, notably in nuclear ‘new comer’ countries, some of which are looking to source fuel from their own uranium resources. Comprehensive extraction (CX) is a sustainable way of looking at extraction of uranium and other valuable commodities like rare-earth elements (REEs), and recycling/reusing residues (waste) in one integrated process.

The gaps and deficiencies identified in a systemic way:

- a) focusing on training and supporting project leaders and their leadership teams as they develop the concepts and design for comprehensive extraction multi-resource projects focused on multi-partner local mining and extraction of uranium or extraction of uranium as a co- or by-product;
- b) creating collaborative interregional networks suited to global rather than solely national approaches to such projects;

Continue

- c) supporting those projects that have already committed to using an improved Pre-Feasibility Study (PFS) template developed by the IAEA expert working group with enhanced design, leadership and commercial realism in mind;
- d) assisting those MSs who have identified the central requirement for enhanced policies and practices in regard to strengthening the processes of social acceptance, critical materials management and waste hierarchy driven waste management practices, and environmental sustainability.

Project in Decommission & Remediation



INT9183 - *Overcoming the Barriers to Implementation of Decommissioning and Environmental Remediation Projects*

Overall Objective:

To increase progress in implementing decommissioning and environmental remediation programmes with special focus on project implementation, complementing the work of the existing collaborative networks and project coordination activities

Specific Objective:

Strengthened MS frameworks for implementation of D&ER programmes, comprising: - legal and regulatory framework including relevant guidance documents - funding schemes - waste management infrastructure - access to relevant technology - arrangements for public involvement in decision making

Continue

Outputs:

- Increased number of personnel qualified to work on implementation of decommissioning and environmental remediation
- Knowledge and experiences on implementation aspects of decommissioning and environmental remediation disseminated reflecting relevant experiences in the Member States

RER9143 *Enhancing Radioactive Waste Management Capabilities*

Overall Objective:

To enhance radioactive waste management capabilities by leveraging regional cooperation, knowledge sharing and infrastructure development

Specific Objective:

Improved capabilities of operators and regulators of radioactive waste management (predisposal and disposal) facilities.

Continue

Outputs:

- Established and/or strengthened national framework to enable safe and sustainable waste management in participating Member States.
- Enhanced capacities of waste owners/waste management organizations to plan and establish viable approaches to implement safe and sustainable life-cycle waste management activities, from waste generation to disposal

Key Element	60,000	50,000	40,000	30,000	20,000	10,000	0
2.1 Update regulatory framework for updating of key elements necessary for the safe and sustainable management of radioactive waste							
2.1.1 WS1: Involvement agreement with national policy, inventory establishment, disposal options and waste acceptance criteria (20 PA8)	60,000	■					
2.1.2 WS2: Planning for RW predisposal activities (20 PA8)	60,000			■			
2.1.3 WS3: Planning for RW disposal (20 PA8)	50,000				■		
2.2 Enhance or establish a comprehensive national legal and regulatory framework							
2.2.1 WS4: regulatory requirements (framework/basis and interactions) to ensure safe management of RW (pre-disposal and disposal) for operators and regulators (20 PA8)	60,000	■					
2.2.2 WS5: national or competent regulations and guidance to cover cradle to grave and transfer issues (promote B2B, Cradle to Grave, ensure safe management of RW) (20 PA8)	60,000		■				
2.2.3 WS6: Regulatory Requirements (Framework/basis and interactions) to ensure safe disposal of RW for operators and regulators (20 PA8)	50,000				■		
2.3 Reinforcing capabilities to implement International Legal Instruments (e.g., Joint Convention, EC Directives)							
2.3.1 WS9: Technical requirements to fulfil national obligations towards International Legal Instruments (e.g., Joint Convention, EC Directives) (20 PA8)	40,000	■					
3.1 Preparation/update of safe and sustainable life-cycle waste management plans: Compliance with the requirements, selection of technical strategy, budget and implementation schedule							
3.1.1 WS8: Preparation of waste management strategies (large programme/inventory countries) (15 PA8)	30,000			■			
3.1.2 WS9: Preparation of waste management strategies (small programme/inventory countries) (20 PA8)	40,000			■			
3.1.3 WS10: Waste acceptance criteria development and use (20 PA8)	50,000	■					
3.2 Establishment and integration of good waste management principles and approaches including waste minimization, recycle and reuse, segregation, characterization and process interface waste acceptance criteria							
3.2.1 EC1: Clearance of radioactive waste from regulatory control (20 PA8)	52,500						
3.2.2 EC2: Clearance of radioactive waste from regulatory control including conditions and free release (20 PA8)	50,000						
3.2.3 EC3: Characterisation methods for new and conditioned radioactive waste (20 PA8)	30,000			■			
3.2.4 EC4: Characterisation of radioactive waste during operational operations (20 PA8)	52,500						
3.3 Establish end points for radioactive waste management i.e. disposal							
3.3.1 WS19: Concepts and design - ILL, HLW & SNF for small inventories (20 PA8)	50,000	■					
3.3.2 WS18: Concepts and design - VLLW & LLW (20 PA8)	50,000						
3.3.3 WS20: Long approaches, technologies and criteria - LLW (20 PA8)	50,000						
3.3.4 WS21: Long approaches, technologies and criteria - ILL & PLW (20 PA8)	40,000						
3.4 Establish and sustain a management system							
3.4.1 WS11: Management systems for the safe management of RW (regulatory and operators) (20 PA8)	60,000						
3.5 Establishment and/or implementation of comprehensive predisposal waste processing schemes to prepare waste for safe storage, transport and disposal							
3.5.1 WS14: Selection and deployment of technical options for acceptance, packaging, transportation, storage (20 PA8)	50,000						
3.5.2 WS15: Modular design and mobile processing facilities for small users (20 PA8)	42,000						
3.5.3 WS16: Processing of legacy and decommissioning radioactive waste (20 PA8)	40,000						
3.5.4 WS17: Long term storage of radioactive waste (20 PA8)	50,000						
3.5.5 WS18: Processing of problematic radioactive waste streams (20 PA8)	40,000						
4.1 Reinforcing safety assessment capabilities and support to licensing installations							
4.1.1 WS24: Development of the safety case and safety assessment of predisposal management activities and facilities for the safe management of RW (20 PA8)	50,000						
4.1.2 WS25: Development of the safety case and safety assessment of near surface disposal activities and facilities for the safe management of RW (20 PA8)	50,000						
4.1.3 WS26: Development of the safety case and safety assessment of geological disposal activities and facilities for the safe management of RW (20 PA8)	40,000						
4.1.4 WS27: Organizing and conducting the review of the safety case and safety assessment for predisposal, establishing conditions of authorisation, developing compliance assurance programmes, and performing inspections (20 PA8)	50,000						
4.1.5 WS28: Organizing and conducting the review of the safety case and safety assessment for disposal, establishing conditions of authorisation, developing compliance assurance programmes, and performing inspections (20 PA8)	50,000						
4.1.6 WS29: Identifying and managing uncertainties in the management of RW (20 PA8)	50,000						
2.3 Preparation/update of waste management strategy							
2.3.1 WS7: Review and update national strategy incorporating updates in national framework (15 PA8)	50,000						
2.3.2 WS8: Regional comparison and benchmarking of national RW strategies (20 PA8)	48,000						

- Capacities of national regulatory authorities to license and exercise regulatory control over facilities and activities for the safe management (predisposal and disposal) of RW upgraded and reinforced

RER9145 - Supporting Human Resource Capacity Building for Developing and Implementing Integrated Programmes for Remediation of the Areas Affected by Uranium Mining

Overall Objective:

To assist in resolving the nuclear legacy problems in the territories affected by uranium mining in the Europe region and to develop competencies in order to properly manage remediation programmes and projects as well as to monitor and operate the ex-uranium production legacy sites.

Specific Objective:

Required skills and competencies of qualified personnel in the management of remediation programmes and projects developed for resolving the nuclear legacy problems in the territories affected by uranium mining in the Central Asia region.

Continue

Outputs:

- Practical competencies developed in the participating Member States with respect to designing and implementing remediation programmes in areas affected by uranium mining.
- Uniformity ensured in approaches, practices and standards followed by affected MS to efficiently implement relevant national activities
- Conformity of national approaches to international standards (IAEA and others) ensured.

Project in Decommission

RER9146 *Enhancing Capacities in Member States for the Planning and Implementation of Decommissioning Projects, for 4 years*

Overall Objective:

To contribute to ensuring the safety and protection of workers, the public and the environment by conducting planning and implementation of decommissioning activities.

Specific Objective:

Capacities enhanced in MSs for the planning and implementation of decommissioning projects of small nuclear facilities or medical, industrial and research facilities that use radioactive materials and sources.

Continue

Outputs

- 80% of the identified small facilities have decommissioning plans under development or drafted
- 30% of identified facilities have decommissioning plans approved or under implementation

Project in RWM

RER9150 *Improving Capabilities to Efficiently Implement Large Ongoing Decommissioning Projects and Waste Management with Minimization of Risks Based on Initiatives and Potential Synergies*

Overall Objective:

To contribute to the efficient implementation of optimized solutions for large ongoing decommissioning projects, waste management and remediation of sites in Lithuania, Slovakia, Bulgaria and Ukraine

Specific Objective:

Capabilities in participating MSs to implement decommissioning projects and manage RAW safely and effectively with minimization of risks on the bases of common shared experience and best proven international practices improved

Continue

Outputs:

- Competence for overall management of decommissioning projects enhanced;
- Knowledge and experience on best proven international decommissioning procedures disseminated
- Expertise for RAW treatment and conditioning facilities and procedures shared and increased
- Approaches for safe storage and disposal of RAW shared and knowledge/experience harmonized with international standards

Q and A ?



Technical
Cooperation
Programme

*Technical cooperation:
delivering results for
peace and
development*

