**Proven Technology**

The ATMEA1 reactor has been designed hand-in-hand with utilities to consider and anticipate their requirements. With a proven design with evolutionary features that has been tested and validated with French and Canadian nuclear safety authorities according to their highest level of safety requirements, and benefiting from a secured supply chain, the ATMEA1 Reactor is the solution the global market can rely on.

**Straightforward Licensing Process**

The ATMEA1 reactor meets international regulatory requirements, and codes and standards. Its design is built on technologies already licensed or validated and components that have been running and tested. It benefits from the EDF Group and MHI extensive experience in licensing reactors and nuclear facilities across the world.

**Smooth Project Execution**

The ATMEA1 reactor brings high confidence to utilities with regard to project execution benefiting from robust and advanced construction techniques and lessons learned, from the EDF Group and MHI experience across the world.

**High Confidence for Operation and Maintenance**

The design of the ATMEA1 reactor takes into account utilities requirements and leverages EDF Group’s operating experience equivalent to approximately 1,750 reactor years. Furthermore, ATMEA shareholder companies, the EDF Group and MHI, are world leaders in providing support for reactor operation and maintenance. In particular the EDF Group together with French Nuclear Industry brings a unique know-how, based on the integrated operating feedback experience of the largest nuclear operator in the world.

**Main Features of the ATMEA1 Reactor**

- **Thermal output**: 3,300 MWth
- **Electrical output**: ~1,200 MWe (Net)
- **Thermal efficiency**: ~37%
- **Plant availability**: 92% (Target)
- **Fuel flexibility**: 12 to 24-month operation cycle length, available for 0 – 100% MOX loading
- **Load follow operation**: 100% – 25% (1% – 3% per minute), including automatic frequency control, instantaneous return to full power capability, and effluent reduction by variable temperature control
- **Design plant life**: 60 years
- **Primary system**: 3-loop configuration
- **Safety system**: 3-train, reliable active system with advanced accumulators
- **Severe accident mitigation**: Core catcher and hydrogen recombiners ensure the long-term integrity of the containment
- **Provisions for airplane crash**: Safety related buildings protected against commercial airplane crash through reinforcement or physical separation
- **Seismic condition**: Available for high seismic area
- **Regulation compliance**: Worldwide including US, Europe, Japan

**Driven by Safety, Based on Experience, Powered by Performance:**

"The Solution for Your Project"

It allows to offer or support comprehensive solutions over the entire nuclear value chain, ranging from reactor design, construction, commissioning, operation and maintenance to nuclear fuel supply, waste fuel management, and decommissioning, as well as support in financing and human capacity building.

Building on our shareholders experience, we can rely on more than 15 years worldwide PWR experience.

- 130 reactors built worldwide
- 350 reactors serviced worldwide
- 100 years nuclear experience in the design, licensing and construction of EPR reactor technology and ongoing projects

With the backing of the French and Japanese governments, we are a true partner in any nuclear power plant project and are here to provide support in the long run.


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**The ATMEA company is a joint venture between France’s EDF Group and Japan’s Mitsubishi Heavy Industries (MHI). It incorporates the unrivalled experience and competences of its shareholder companies: two world renowned leaders in the nuclear industry (EDF and MHI) and the extensive experience of Framatome. The combination of these complementary strengths has been leveraged to develop a Generation III+ medium-sized PWR technology, the ATMEA1 reactor.**
The ATMEA1 reactor is, by design, protected against external hazards. The leaktight containment, dedicated heat removal systems and core catcher prevent the release of radioactive materials outside of the reactor. The ATMEA1 reactor boasts a number of features required to bring the plant to a safe state without any off-site support.

### PROTECT

**High level of seismic activity**
- Earthquake resistant design based on Japanese experience.
- Proven operation under medium intensity—very high level of seismic activity.

**Floodings**
- Multi-level design and solid concrete prevent plant flooding.
- Relocation of electrical and I&C equipment is ensured in upper floors and all radio-shielded buildings are protected by watertight walls and doors.

**Maintenance and including a commercial apse span**
- Radioactive skeleton and geographical location of all equipment prevent long term contamination of the personnel and the environment.

A fully safe and protected set of means for evacuation around the reactor allows the plant to be safe in the event of an emergency.

### COOL

**The ATMEA1 Reactor Capacities**
- The ATMEA1 reactor boasts a number of systems and water reserves to ensure that cooling capacity is always operational.
- Diversified and redundant cooling systems
  - 5% in core, each capable of bringing the reactor to a controlled state, with a water supply to maintain cold shutdown conditions.
  - One diversification plan to ensure cooling supplied and accident management in extreme circumstances.
- Over 30 days of autonomous cooling and electricity
- Multiple large onsite water reserves and a second electricity supply and accident management in extreme circumstances.

**Additional margins as electrical and I&C systems**
- Electrical and I&C systems are fully protected diversified Ultimate Heat Sink.
- Multiple large onsite water reserves and a second electricity supply and accident management in extreme circumstances.
- 1,200 MWe (net) reactor, designed for 50 or 60 Hz and to cope with degraded grid conditions.

### CONFINE

**Resistance to External Hazards**
- In the very unlikely event of a severe accident, the ATMEA1 reactor boasts a number of features to ensure that the accident scenario confined within the plant.
- Depressurization valves, provisions against steam explosions, passive autocatalytic depressurization devices and isolation of the containment design itself prevent internal explosions.
- The leak-tight containment, dedicated heat removal systems and core catcher prevent the release of radioactive materials outside of the reactor.
- Under accident conditions:
  - Active systems initiated automatically during the first few seconds of the event
  - Loss of off-site support requires no action.

### FLEXIBLE

**Flexible to Meet Operator Needs**
- Flexibility in operation
- High plant availability
- High thermal efficiency
- Adaptation to site and grid conditions
- ~1,200 MWe (net) reactor, designed for 50 or 60 Hz and to cope with degraded grid conditions.
- Suitable for diverse cooling scenarios, various ambient and seismic conditions.
- High competitive lifetime thanks to its powerful active systems, well-designed passive systems, diversified Ultimate Heat Sink and its very high efficiency.
- Full inspection and operation activities considered safe and effective at the design stage for plant layout.

### OPERATOR-FRIENDLY

**Easy, Smooth and Safe Operation and Maintenance**
- Human factors engineering
- Inspection and operation are before considered at the design stage for plant layout.
- Improved protection and safety of workers
- Lowest occupational exposure in line with the most stringent requirements.
- The ATMEA1 reactor technology is an evolution of well-known PWR technology concepts and procedures.
- Condition-based and performance accident management are made easier and the risk of human error is minimized.
- Advanced digital I&C systems
- More than 80 safety I&C systems have been installed in 44 reactors, in 17 countries, offering improved protection and safety of workers.

### COST EFFECTIVE

**High Economic Performance**
- A 40-year operating life with no costly replacement of heavy components
- Reactor design, material selection protecting the reactor itself.
- Use of specially selected materials prevents stress corrosion.
- Plant availability of 92% (Target)
- Reduced outage costs thanks to its power maintenance and fast shut-down schedules.
- Reliable design, systems and equipment ensure safe, undisturbed operation.
- Thermal efficiency of ~37%
- Myriad safety features guaranteeing an average thermal efficiency of ~37%.
- Easy, Smooth and Safe Operation
- Reduced operation and maintenance costs
- High thermal efficiency
- Improved protection and safety of workers
- Condition-based and performance accident management are made easier and the risk of human error is minimized.
- Advanced digital I&C systems
- More than 80 safety I&C systems have been installed in 44 reactors, in 17 countries, offering improved protection and safety of workers.

### COMPETITIVE POWER GENERATION

**The reliable, medium-sized ATMEA1 reactor uses the latest modular reactor technology to all systems proven and operating for decades of PWR in around the world.**

It offers high economic performance for a diverse fleet enabling electricity generation costs.