

# Chapter **1**

## Introduction

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# Chapter 1

## Introduction

### 1. Background

In introducing and generating nuclear power, it is necessary to respond appropriately to various technical troubles in operation that cannot be avoided when using these technologies. In the US, which has the largest nuclear power capacity in the world, regulators and operators have overcome various troubles, such as the Three Mile Island 2 accident (TMI accident), to ensure both nuclear safety and its effective use. On the other hand, in Asia, in the wake of the Fukushima Daiichi accident, some countries such as Taiwan and the Republic of Korea have changed course and are moving towards abandoning nuclear power. In Japan, where the nuclear capacity factor had been improved in the past, restarts have been delayed due to prolonged safety review.

For countries considering the introduction of nuclear power, it is important to know how to both improve nuclear safety and increase the capacity factor and continue stable operations even before they construct the first reactor. Therefore, Asian countries need to acquire knowledge, experiences, and lessons from precedents in Japan and the US, together with major European countries such as the United Kingdom (UK) and France.

In this report, capacity factor – per definition of the International Atomic Energy Agency (IAEA, n.d.) Glossary of Terms in Power Reactor Information System (PRIS) reports – means ‘the actual energy output of an electricity-generating device divided by the energy output that would be produced if it operated at its rated power output (reference unit power) for the entire year.’ The IEEJ created graphs for capacity factor and fiscal year from IAEA PRIS data.

### 2. Purpose

This report aims to clarify common conditions necessary for the improvement of both nuclear safety and effective use, and to compile the policy proposals for what kind of actions stakeholders – including operators and regulators – should take.

### **3. Study Method**

#### **1) Literature survey**

The study team collected information in Japan, the US, and major European countries on major troubles that had affected the capacity factor. It also researched on the communication between the regulator and operators, which would impact the capacity factor, by collecting disclosed documents from regulatory bodies, operators, international organisations, research institutes, and others.

The literature survey is discussed in chapter 2.

#### **2) Interview survey**

The study team visited the US and major European countries to interview experts on nuclear safety and use for further analyses.

The contents of the interview survey are discussed in chapter 3.

#### **3) Compiling the analytical report on contributing factors**

The study team completed the report to share with the EAS member states on the contributing factors to improve both nuclear safety and effective use.

Chapter 4 presents a composite analysis and the policy proposals as recommendations.