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Risk Assessment Guideline for Nuclear Insurance

核保险风险评估工作指引

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Table of Contents

Foreword	II
1 Scope	1
2 Terminologies and Definitions	1
3 General Framework of Nuclear Insurance Risk Assessment	2
4 Nuclear Insurance Risk Assessment Method	4
5 Nuclear Insurance Risk Assessment Report	5
Bibliography	7

Foreword

The standards are drafted according to the rules of GB/T 1.1—2009.

The standards are formulated and administered by IAC.

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Risk Assessment Guideline for Nuclear Insurance

1 Scope

The standards herein contain provisions with regard to the general framework, modules and procedures for the risk assessment of nuclear facilities that are currently in operation or are about to be put into operation.

The standards are applicable to nuclear insurance risk assessment that is conducted by insurance industry on nuclear facilities. The standards can be used as reference to the nuclear insurance risk assessment of radioactive sources and radiation-emitting devices.

2 Terminologies and Definitions

The following terminologies and definitions are applicable to the standards herein.

2.1 Nuclear Facility

Nuclear facilities refer to all nuclear reactors and assemblies including nuclear power plants, nuclear thermal power plants, nuclear steam and heating supply plants, reactors other than nuclear power plants such as research reactors, experimental reactors and critical assemblies, nuclear fuel cycle facilities including the production, processing, storage and reprocessing of nuclear fuel, and facilities that are used for the treatment, storage and disposal of radioactive wastes, all of which are used for non-military purpose.

2.2 Nuclear Insurance

Nuclear insurance refers to insurance where the insurer has to assume the liability for compensation as stated in insurance contract in the event of any property damage or personal injury/death as a result of accidents which have occurred in nuclear facilities or during transportation of radioactive materials related thereto, covering nuclear material damage and business interruption insurance, nuclear third party liability insurance, radiation employer liability insurance, and nuclear material transportation insurance, as well as other insurance businesses deemed necessary for nuclear facilities by China Banking and Insurance Regulatory Commission, with exception to insurance unrelated to nuclear risk of the nuclear facility covered before first fuel loading or first feed.

2.3 Nuclear Risk

Nuclear risk refers to the loss and damage arises out of or results from ionizing radiation emitted by any source of radiation inside a nuclear installation, or emitted from nuclear fuel or radioactive products or waste in, or of nuclear material coming from, originating in, or sent to, a nuclear installation, whether so arising from the radioactive properties of such

matter, or from a combination of radioactive properties with toxic, explosive or other hazardous properties of such matter.

2.4 Risk Assessment

Risk assessment refers to the process to measure the probability of risks and the extent of losses so as to decide on relevant steps to be taken on the basis of risk identification and risk estimation and with reference to good practices and general indexes of the industry and other factors.

3 General Framework of Nuclear Insurance Risk Assessment

Nuclear insurance risk assessment refers to the risk appraisal and technical evaluation that are conducted in different areas such as plant conditions, organizational management, safety culture, operation and operating experience, training, radiation protection, industrial safety, equipment performance, configuration management, maintenance, technical support, chemistry, fire protection, and emergency preparedness, with reference to the highest international standards of the industry, the general performance indexes, and the good practices, and on the basis of feedbacks derived from historical insurance loss, and from the perspectives of loss prevention.

3.1 Nuclear Insurance Risk Assessment Purpose

- a) To provide technical support and underwriting advice, and to help underwriter identify and control risks.
- b) To offer risk management advices and introduce international good practices and operating experiences in various areas to the insured or the potential insured, and to assist the insured or the potential insured to improve risk management and enhance safe operation standard from the perspective of loss prevention.

3.2 Nuclear Insurance Risk Assessment Subject

3.2.1 Nuclear Power Plant

On principle, reactors that are on the same site and are built in the same period or of the same type shall be categorized into one nuclear insurance risk assessment unit. For reactors that are built in different periods or have different types of nuclear assemblies, the scope of nuclear insurance risk assessment may be decided upon with the insured or the potential insured according to *No. 12 Instruction on the Methods to Categorize Risk Units for Property Insurance: The Operating Period of Nuclear Power Plant* as issued by the regulating authorities.

3.2.2 Nuclear Facilities other than the Nuclear Power Plant

On principle, the nuclear facilities that are on the same site and are built for the same purpose or for the same function shall be categorized into one nuclear insurance risk assessment unit. For nuclear facilities that have nuclear assemblies of a variety of types and functions, the

scope of nuclear insurance risk assessment may be decided upon with the insured or the potential insured.

3.3 Nuclear Insurance Risk Assessment Period

3.3.1 Nuclear Power Plant

- a) For any nuclear power plant that is about to be put into operation, nuclear insurance risk assessment shall be conducted before its first fuel loading.
- b) For any nuclear power plant that is already in operation, nuclear insurance risk assessment shall be conducted on a regular basis. On principle, the period of nuclear insurance risk assessment is as follows:
International Nuclear Insurance Risk Assessment period: once every four or five years;
Domestic Nuclear Insurance Risk Assessment period: once a year. Combine when the two processes occur simultaneously.

3.3.2 Nuclear Facility other than the Nuclear Power Plant

On principle, nuclear insurance risk assessment shall be carried out once every two years owing to the complexity of this type of nuclear facilities. The nuclear insurance risk assessment period shall be agreed upon after discussion with the insured.

3.4 Nuclear Insurance Risk Assessment Area

Normally, nuclear insurance risk assessment is conducted in three areas: Nuclear Safety, Operations & Third Party Liability, Machinery Breakdown, and Fire Protection.

3.4.1 Details of Nuclear Insurance Risk Assessment Area

- a) Nuclear Safety, Operations & Third Party Liability: chiefly includes plant conditions (including natural risks and artificial risks), management and operation, nuclear safety management, nuclear safety culture, and off site third party liabilities.
- b) Machinery Breakdown: chiefly includes organization and management about major machinery, electrical and I&C equipment and basic information, failure logs, modification information, maintenance records, maintaining processes, and major problems discovered from the maintenance of major equipment.
- c) Fire Protection: chiefly includes the organization and management, combustible material control, fire compartment and building construction, fire protection system design and maintenance, fire brigade, fire protection for special risk areas, and fire protection considerations for nuclear risks.

3.4.2 Choice of Nuclear Insurance Risk Assessment Areas

One or more areas may be chosen for each nuclear insurance risk assessment. The exact coverage of the nuclear insurance risk assessment shall align with that of the insurance policies.

3.5 Nuclear Insurance Risk Assessment Surveyor

In light of the particularity of nuclear facilities, the surveyors should have qualifications or must be professionally competent, and nuclear insurance risk assessment should be conducted in strict accordance with the regulations of nuclear facility operator. The surveyors should abide by the rules of confidentiality, and should make sure that the files, documents and other information provided by nuclear facility operator should be used for the nuclear insurance risk assessment purposes only, and that the confidentiality of all the information including the nuclear insurance risk assessment report itself should not be compromised in the using and transmitting process.

4 Nuclear Insurance Risk Assessment Method

The nuclear insurance risk assessment can be conducted via questionnaire, document review, technical interviews and plant walkdown.

4.1 Nuclear Insurance Risk Assessment Procedure

Nuclear insurance risk assessment procedures chiefly include the following:

- a) Making pre-survey preparations;
- b) Conducting plant risk surveys;
- c) Drafting nuclear insurance risk assessment report.

4.2 Nuclear Insurance Risk Assessment requirement

4.2.1 Pre-survey preparation

4.2.1.1 Discussing with the insured or the potential insured to agree on the date, scope, contents of the nuclear insurance risk assessment and decide on such issues as surveyors and agenda.

4.2.1.2 Collecting data

Issuing questionnaires and collecting necessary data. The data to be collected chiefly include but are not limited to the following:

- a) Profile about the operator;
- b) Profile about the nuclear facility;
- c) Profile about the nuclear facility' s major equipment;
- d) Profile about the nuclear facility' s fire protection.

4.2.2 Plant Risk Survey

Nuclear insurance risk assessment surveyors can be classified into three groups, namely, the group of Nuclear Safety, Operations & Third-Party Liability, the group of Machinery Breakdown and the group of Fire Protection. If necessary, a separate group of nuclear safety culture can be instituted. Each group shall conduct the risk survey according to the standards and guides via document review, technical interviews, plant walkdown, among others.

4.2.3 Discussions on Risk Improvement Recommendations from previous surveys

Nuclear insurance risk assessment team shall hold discussions with the nuclear facility operator about risk improvement recommendations from previous surveys. If improvements have been made and are regarded as satisfactory by the insurer, such recommendations should be closed.

5 Nuclear Insurance Risk Assessment Report

5.1 Contents of the Nuclear Insurance Risk Assessment Report

The nuclear insurance risk assessment report should include subject profile, subject risk analysis, results of risk survey, and risk improvement recommendations.

5.1.1 Subject Profile

Subject Profile includes but is not limited to the nuclear facility's location, facility type, designed size, construction and operation period, plant conditions, adjacent population and economic standards as well as the equity structure, organization structure, and human resources of the operator.

5.1.2 Subject Risk Analysis

Subject risk analysis shall cover the nuclear facility's major risk sources, risk types and risk variation.

5.1.3 Nuclear Insurance Risk Assessment Result

The nuclear insurance risk assessment report shall offer qualitative or quantitative evaluation of the nuclear facility's nuclear insurance risks.

5.1.4 Risk Improvement Recommendation

- a) The nuclear insurance risk assessment report shall propose risk improvement recommendations in light of the identified concerns that may weaken the nuclear facilities' overall risk-resistant capabilities. The risk improvement recommendations aim to assist the insured or the potential insured to improve risk control capabilities and enhance safety management from the perspective of loss prevention and in reference to the operating experiences and the international good practices for that area;
- b) The risk improvement recommendations should be graded according to the gravity of the potential consequences of the risk and the amount of expenses that have to be spent on the improvement.

5.2 Submission of Nuclear Insurance Risk Assessment Report

Upon conclusion of the assessment, the survey team shall submit an nuclear insurance risk assessment report to the insured or the potential insured within a given limit of time. Upon receipt of the nuclear insurance risk assessment report, the insured or the potential insured

could conduct internal assessment in accordance with the risk improvement recommendations, and be encouraged to provide written feedbacks to the nuclear insurance risk assessment team within a set limit of time.

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