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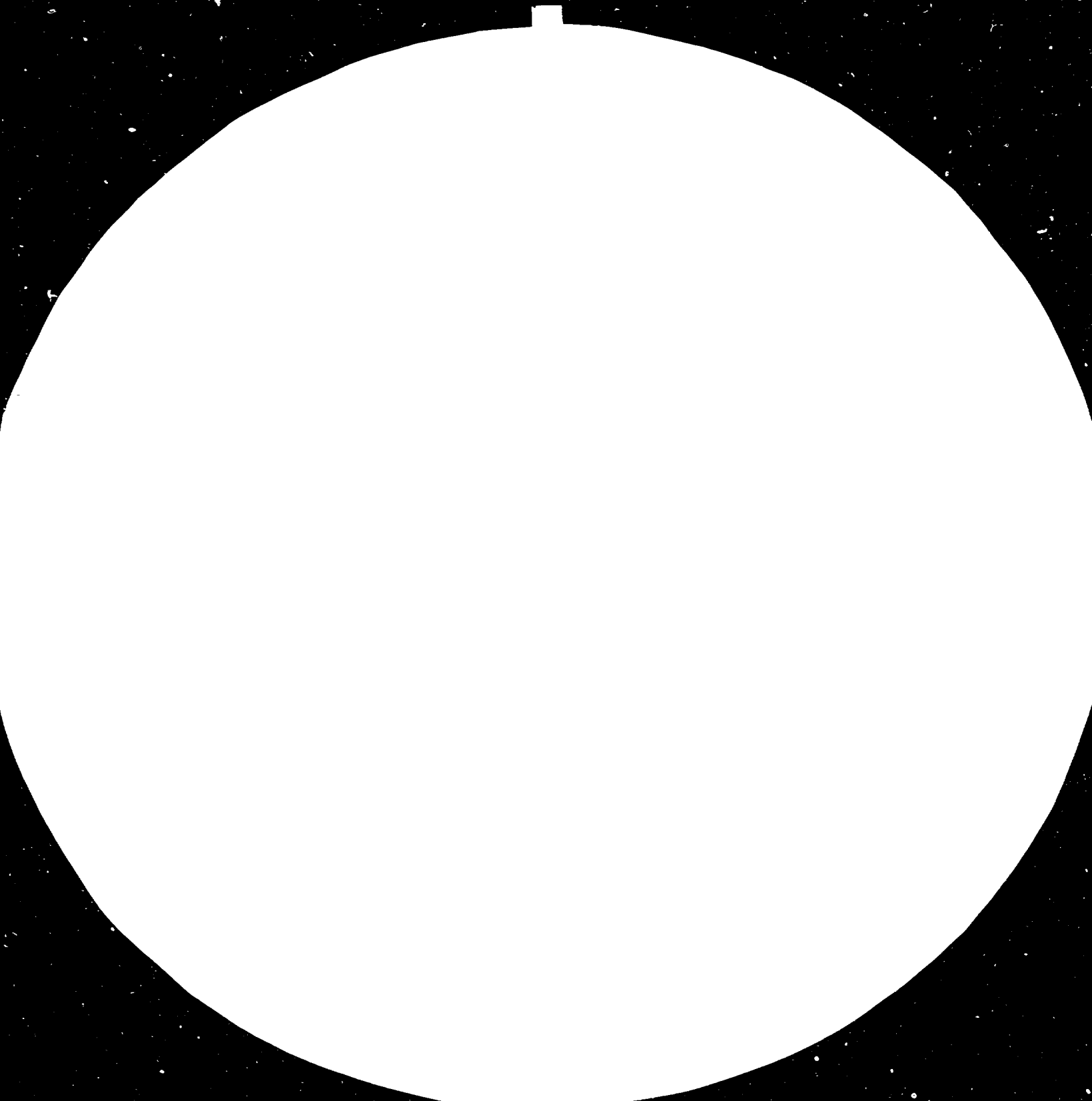
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Resolution test patterns are available from the National Bureau of Standards, Gaithersburg, MD 20899. For more information, contact the National Bureau of Standards, Gaithersburg, MD 20899.

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English

RISK ANALYSIS OUTLINE

for the

UNIDO INSURANCE CONCEPT

proposed by

the UNIDO Secretariat

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INTRODUCTION

The insurance policy envisaged by UNIDO is designed to provide the Purchaser of an industrial plant with adequate compensation for his consequential losses incurred due to the late completion or the non-performance of the plant caused by or resulting from:

- (a) Faulty engineering, research, process, or technology
- (b) Faulty project or construction management or technical assistance
- (c) Faulty manufacture, installation, erection, construction, repair, or rectification
- (d) Faulty workmanship or materials.

The insurance policy will not cover:

- (a) Risks which are insured under any other policy of insurance or which are the subject of indemnity under any other policy of insurance
- (b) Any additional costs, expenses, commitments and consequential losses which are the responsibility of the Contractor(s) or his Sub-Contractors, Suppliers or Manufacturers under contract(s) or purchase orders
- (c) Losses resulting from:
 - Financial failure or default
 - Currency exchange fluctuations
 - The choice of an unsuitable location of the plant
 - Any actions or inactions of the Purchaser which prevent the Contractor(s) or his Sub-Contractors, Suppliers or Manufacturers from performing their contractual obligations
 - War, invasion, act of foreign enemy, hostilities, civil war, rebellion, revolution, insurrection or military or usurped power, riot, civil commotion, or sabotage
 - Strikes or labour disturbances
 - Any restrictions on construction, reconstruction, repair or operation of the plant imposed by Purchaser's Government or other Public Authority
 - Any consequences of nuclear reaction, nuclear radiation or radioactive contamination.

It is understood that the Insurers will require a comprehensive and independent pre-contract Risk Analysis as one of the conditions for considering issuing an insurance policy for a project. The scope of such a Risk Analysis is outlined herein.

DEFINITION OF CONSEQUENTIAL LOSSES

The consequential losses incurred by the Purchaser may include different elements, depending on whether the losses are incurred before or after Final Acceptance of the plant. A preliminary list of the possible elements of consequential losses is provided below. It ought to serve as a point of departure for determining a complete list for a particular industrial plant.

Before Final Acceptance

The consequential losses before Final Acceptance may include:

- (a) Loss of Gross Profit: the difference between the selling price of the product of the plant and the cost of producing the product
- (b) Extra Expense to Purchase Product: in order to fulfill contractual sales commitments, Purchaser may have to purchase the product on the open market, at some extra expense over and above the normal selling price for his plant's product
- (c) Extra Expense to Store Raw Materials: Purchaser may have to store raw materials elsewhere than on site in order to fulfill raw material purchase contracts
- (d) Capital Cost Increase: Assuming that capital costs are capitalized at Final Acceptance, Purchaser may incur additional interest expenses and additional costs of his staff due to delayed Final Acceptance
- (e) Contractual Liabilities: Purchaser may have entered into agreements with third parties and failure to meet his obligations due to delayed plant start-up may expose Purchaser to extra costs such as penalties or liquidated damages
- (f) Extra Repair Expense: If Contractor's warranties do not apply, Purchaser could have to bear the cost of repairing or rectifying design defects, mechanical breakdowns or malfunctions in excess of what is allowed in the plant specifications
- (g) Extra Expense to Minimize Delays: Purchaser may have to incur extra expense to expedite repairs or rectifications of problems, whether or not Contractor's warranties are still in effect.

After Final Acceptance

After Final Acceptance of the plant by Purchaser, the consequential losses may include:

- (a) Extra Expense to Purchase Product: in order to fulfill contractual sales commitments, Purchaser may have to purchase the product on the open market, at some extra expense over and above the normal selling price for his plant's product
- (b) Extra expense to Store Raw Materials: Purchaser may have to store raw materials elsewhere than on site in order to fulfill raw material purchase contracts
- (c) Contractual Liabilities: Purchaser may have entered into agreements with third parties and failure to meet his obligations due to plant downtime may expose Purchaser to extra costs such as penalties or liquidated damages
- (d) Operating Losses Due to Partial or Total Interruption of Production: Purchaser could suffer operating losses if the plant partially or totally fails to operate to specifications due to design defects, mechanical breakdown, unavailability of spares, etc.
- (e) Extra Repair Expense: If Contractor's warranties have expired, Purchaser could have to bear the cost of repairing or rectifying design defects, mechanical breakdown or malfunctions in excess of what is allowed in the plant specifications
- (f) Extra Expense to Minimize Downtime: Purchaser may have to incur extra expense to expedite repairs or rectifications of problems, whether or not Contractor's warranties are still in effect.

Evaluation of Consequential Losses

The Risk Analysis will quantify the elements of consequential losses to arrive at a per diem amount for consideration as the Rate of Indemnity in the insurance policy.

In order to to do so, the Risk Analysis would have to obtain information from various sources, such as:

- the feasibility study of the project,
- the Purchase Contract,
- the specifications for the plant,
- Discussions with Purchaser as to his potential liabilities under agreements with third parties in the event of a delay of completion

of the plant, or an interruption of production,

- Discussions with Purchaser, Contractor and others to establish estimates for repair times and costs for various delay and break-down possibilities,
- Lenders and Purchaser, to establish the extra interest and capital costs due to delayed completion.

An early review of any feasibility studies, contract documents, and pre-qualification submissions made to Purchaser by interested project bidders would assist the Risk Analysis, and could give an early preliminary indication of the amount of delay or downtime losses faced by the Purchaser.

The effect of "waiting periods" on the potential consequential losses would be assessed as part of the Risk Analysis.

SCOPE OF THE RISK ANALYSIS

The outline of the scope of the Risk Analysis is kept very general intentionally to make it applicable to any type of industrial plant, and recognizing that the scope may vary somewhat depending on the type of industrial plant to be analyzed, the Purchaser's country, and the specifics of the contractual conditions between the Purchaser and Contractor(s).

The objective of the Risk Analysis is to deliver a report addressing five main areas:

- (a) An evaluation of the Contractor(s),
- (b) An evaluation of the project,
- (c) An evaluation of the Purchaser,
- (d) An assessment of the consequential loss potential,
- (e) Definition of Risk Management requirements.

(a) Evaluation of the Contractor(s)

The Contractor(s), Suppliers and Manufactureres tendering for the construction of the project are evaluated and ranked in terms of their relative ability to handle the project under consideration.

Specific areas of investigation and analysis will include:

- their history of previous performance, in general, and specifically for this type of project
- their capability to meet their obligations under the contract
- their previous overseas experience
- the expertise of their organizations and key personnel
- their organizational stability, turnover of staff, etc.
- their engineering and project management systems
- their quality assurance procedures
- their ability to make good defects and perform maintenance duties
- the warranties and guarantees they normally give compared to those requested under the contract

- their financial capability, particularly in respect to bonding and working capital
- their ability to operate in the Purchaser's country.

(b) Evaluation of the Project

The project will be evaluated to determine the possibilities and probabilities of delay or downtime due to the risks mentioned in the introduction:

- whether the plant is of proven design, or whether it contains some prototype or state-of-the-art components
- the history of performance under various climatic conditions
- the history of construction, installation, start-up, and operational performance
- the sensitivity of the design and construction to local conditions, local materials, local labour, and local raw materials and consumables
- the reliability of the plant process and control systems, including the question of built-in redundancy, on-hand spares, maintenance procedures, etc.
- the examination of components which require special attention during design, engineering, procurement, construction, and commissioning
- the suitability of proposed construction methods
- the availability of back-up suppliers and manufacturers
- the effectiveness of proposed safety measures.

(c) Evaluation of the Purchaser

The Purchaser is evaluated to determine:

- his ability to work with the Contractor(s) and other participants
- his ability to meet his obligations under the contract
- the capabilities of the consulting engineers employed by him and acting as his engineer on the project
- the duties and expertise of his engineers or staff during design, procurement, construction, commissioning, and operation of plant.

(d) Consequential Loss Potential

The events which may cause delays or non-performance will have been evaluated and their respective probabilities of occurrence will have been assessed. The consequential loss for each delay or non-performance producing event will be estimated.

Risk reduction techniques will be applied to reduce the probability of occurrence of the undesired events and/or the impact of their consequences.

After risk reduction measures have been applied, the probabilities of the events and their associated consequential losses will be aggregated to provide an overall measure of the probability of occurrence of various degrees of consequential loss.

Various "waiting periods" will be examined to determine how they may affect the expected consequential loss and the maximum probable consequential loss.

(e) Risk Management Requirements

The Risk Analysis will also define the risk management requirements for the project. The risk management plan will include:

- the milestone dates for site visits:
 - i) at dates when Purchaser is required to "provide" or "accept" or "approve" something according to his obligations under the contract
 - ii) at key progress verification dates
 - iii) at the occurrence of claims, whether or not covered under the insurance policy
- the risk management procedures required:
 - i) acceptance procedures
 - ii) verification of the quality of items to be supplied by Purchaser
 - iii) verification of the qualifications of Purchaser's engineers and staff
 - iv) claims administration and progress reporting
- a collection of contingency plans to refer to in the event of problems during construction, commissioning, or operation of the plant.

