Bureau Veritas Services

RELIABILITY, AVAILABILITY & MAINTAINABILITY (RAM) STUDIES
An innovative approach to solving production related risks.

BUSINESS CHALLENGE
A well-designed and properly implemented asset optimization program can significantly lower project costs. Reliability, Availability & Maintainability (RAM) modeling assesses a production system’s capabilities, whether it is in operation or still in the design phase. The results from a RAM modeling will identify possible causes of production losses and can examine possible system alternatives. The RAM study is thus a tool for decision-making with help for costs versus benefits analysis.

SOLUTION
What is RAM Modeling?
RAM modeling can simulate the configuration, operation, failure, repair and maintenance of equipment. The inputs for a RAM modeling will include the physical components, equipment configuration and maintenance philosophy in a system and the outputs can determine average production of the system over the facility or vessel life.

RAM studies will generate sufficient data needed in order to make decisions for possible systems changes that may increase system efficiency, and therefore increase project profits.

WHY CHOOSE BUREAU VERITAS?
Bureau Veritas’ RAM modeling capability has been previously sought by companies looking to increase the productivity of their systems. Bureau Veritas has extensive experience that has been developed through more than 100 RAM and supply chain studies.

Bureau Veritas can guide you through the RAM process to help answer tough questions including:
- Identifying bottlenecks in the production
- Detecting failures in the early part of design
- Comparing different design options for production
- Optimizing maintenance schedules
- Increasing the effectiveness of logistics
- Identifying equipment maintenance priorities on failure
- Meeting contract production requirements

RELATED SERVICES
- Functional Analysis
- Root Cause Analysis (RCA)
- Fault Tree Analysis (FTA)
- Reliability Centered Maintenance (RCM)
- Failure Mode Effects Analysis (FMEA)
- Weibull Analysis
- Planned Maintenance Optimization (PMO)
OUR APPROACH

Our reliability engineers will liaise with you to identify your needs and develop the basis for the RAM model. We use tools and methodology of both functional and dysfunctional analyses to agree upon the model configuration and start the modeling exercise.

Our team can use various modeling tools for RAM studies depending on your requirements:
- Bureau Veritas Monte Carlo Simulator Optimise®
- Reliability Block Diagrams (RBD)
- Stochastic Block Diagrams with Monte Carlo simulation
- Markov Graphs
- Petri Nets with Monte Carlo simulation

FAQ

What are the advantages of Petri Nets or Optimise® for managing availability studies?
These are used to model the dynamics of a repairable system in case of a failure. These models accurately and closely represent the system. The flexibility of the models allows us to measure the effect of storage capacities, the maintenance policy, or the reconfiguration of the system on the system availability.

What kind of recommendations can you make after a RAM analysis?
Based on the RAM results and dedicated sensitivity cases, we make recommendations to improve the system availability: add equipment in parallel to the one that is often unavailable, keep spare parts in the store, or make sure to reduce maintenance, etc. With input from our client, it’s possible to perform a cost-vs.-benefits analysis.

What is the input data needed for the performance of services by Bureau Veritas?
In order to model a system and perform our analyses and calculations, we will need additional data:
- P&ID / Electrical schematics
- Functional specifications
- Description of expected modes of operation
- Information issued from workshops with your teams

CONTACT

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FOR MORE INFORMATION

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