The Royal Australian Navy Submarine Escape and Rescue Service (SERS)

The Requirement

The Royal Australian Navy (RAN) Submarine Escape and Rescue Service (SERS) provide a capability for the recovery of submariners from a disabled Collins Class submarine, although the capability can be made available to other submarine operating nations.

BMT Isis Ltd was contracted by BMT Defence Services (Australia) to produce a SERS Safety Case Report (SCR) for the Director Collins Class System Program Office (COLSPO) based at HMAS STIRLING, Garden Island, West Australia.

COLSPO is responsible for generation and oversight of new projects and improvements to the COLLINS Class Submarine, including the approval of engineering configuration changes and providing technical advice. As part of the ongoing support to the COLLINS Class, COLSPO also manages the SERS support contract. The Submarine Force Element Group (SMFEG) is headed by the Commander Australian Navy Submarine Group (CANSIG) and is responsible for managing the submarine escape and rescue capability for the Chief of Navy (CN) and delivering submarine escape and rescue capability to Commander Australian Fleet (COMAUSFLT).

In order to determine the safety status of SERS, BMT Isis carried out holistic safety assessments of each element of SERS. From this, and a review of existing safety management and organisational arrangements, the SERS SCR now provides the Director COLSPO, as Duty Holder responsible for delivery of the capability, and SERS Stakeholders who use the capability, with visibility of the current safety status and a Forward Action Plan for effective safety management. The SCR also provides the Duty Holder and Stakeholders with the source of key safety information to enable:

a. Safe operation of SERS within the defined design limitations;

b. Operation of SERS within the legal requirements of the Department of Defence and other national and internal statutory legislation, rules and regulations;

c. Operation within a defined Safety Management System (SMS).

Our Approach

BMT Isis conducted the task in three phases. Phase 1 addressed Data Acquisition and Evaluation; Phase 2 SERS element Safety Assessments and Phase 3 was the production of the Safety Case Report. The safety assessment process generated risk assessment sheets to facilitate the transfer of the assessment outcomes into the Submarine Hazard Log, within which SERS hazards are embedded. The outcomes were also used to inform the SCR.

Data Acquisition, Evaluation and Gap Analysis

BMT Isis undertook the identification, analysis, collation and analysis of documentation and data necessary to support the Safety Case Report. The documentation and data (in hard and soft copy) was obtained from the RAN, Design Authorities, the SERS Support Contractor and publicly published sources where appropriate. BMT Isis also visited all available SERS assets in country at the time, and LARS in Scotland, for data collection. Analysis continued throughout the period as additional evidence became available.

Safety Assessment

The preliminary hazard list was based upon BMT Isis experience with the UKSRS and NSRS and developed further and agreed by Suitably Qualified and Experienced Personnel (SQEP). The risk assessment process was in general accordance with the requirements of ABR 6303 - The Navy Safety Systems Manual.

Safety Assessments were carried out on:

a. The Australian Submarine Rescue Vehicle (ASRV REMORA);
b. The Launch and Recovery System (LARS);
c. The Transfer Under Pressure (TUP) facility;
d. The Deck Decompression Chambers (DDC);
e. Base operations, mobilisation and transportation of SERS assets from the support contractor’s storage facility at Osbourne Park, Perth WA to the target port of departure;

f. Embarkation onto and disembarkation from the designated Mothership (MOSHIP);

g. SERS interface with the target MOSHIP

Throughout each safety assessment, SERS capability operations, evolutions and activities were considered in order to identify hazards that may impact upon personnel safety, fitness for service, the mission and the environment. Hazards were captured and risk was assessed within groups of suitably qualified and experienced SERS personnel. The assessment process also served to inform, and confirm where appropriate, Class Certification details and gaps in the body of evidence. These were recorded and articulated within the SCR.

The Outcome

The Safety Case Report produced by BMT Isis reflects the safety state of SERS in April 2008, using information determined from document review and gap analysis, and the seven Safety Assessments. The SCR is delivered in two volumes, Volume 2 being the body of evidence from each safety assessment. The structure of Volume 1 reflects the requirements articulated within ABR 6303, the RAN Safety System Manual, and is as follows:

- Executive Summary - providing an overall statement of the safety status of SERS, a summary of the hazards identified, the tolerability of residual risks resulting from the hazards, significant issues and recommendations arising from development of the Safety Case Report;
- Introduction - includes the background to the evolution of the SERS capability, the scope of the report and the interfaces and assumptions used as the basis for the report;
- SERS Safety Policy - addresses, overarching safety policy, concepts, doctrine and operational requirements, safety targets and objectives, derivation of the safety targets and the boundary of submarine operations;
- SERS Stakeholders - identified RAN and Defence Materiel Organisation responsibilities, commercial arrangements with industry and functional roles;
- SERS System Description - includes a brief description of each SERS element and its role, more detail being within the appropriate element safety assessment report;
- Regulation and Certification - discusses statutory regulations, commercial certification, hazardous material certification and the requirements of the International marine Contractors Association. It identifies any concessions or shortcomings in current certification.
- Gap Analysis - this section details the areas within the Safety Case where no body of evidence exists and identify the actions required to address the shortfalls;
- Safety Management System - the section mirrors the SMS structure within ABR 6303 and identifies the extent of compliance;
- Safety Assessment - articulates the methodology, Accident Consequence and Hazard Likelihood definitions, hazard risk indices, acceptability definitions, a summary of the safety assessments and a summary of extreme and high level risks;
- Operational Limitations - identifies issues associated with casualty retrieval and the medical requirements and treatment needs during the handling of escapees;
- ALARP Safety Statement
- Emergency and Contingency Arrangements for each element of SERS;
- SERS Safety Claim - describes the Claims, Arguments, Evidence methodology employed to oversight the safety claim;
- Conclusions - this section provides the conclusions drawn from the work undertaken to support the SERS Safety Case Report;
- Recommendations - this section draws from the conclusions and offers a Forward Action Plan to prioritise effort for resolution of current safety issues.

Customer Comment

CAPT Bronko Ogrizek RAN, Director Collins System Program Office says “I am very pleased with the SERS Safety Case Report delivered by BMT. It is clearly an independent, honest and fearless analysis of SERS safety status, organisation and arrangements, and gives me clear advice as to how we can improve and progressively move forward.”