

## Phase 2 support to managing the wreck of the SS Richard Montgomery – Summary Report



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### Background

The SS Richard Montgomery is a wartime wreck located 3.1km offshore from Sheerness containing munitions, mostly aircraft bombs, with an estimated total explosive content of 1400 tonnes. The Defence Science and Technology Laboratory (Dstl) was requested to assist the Department for Transport (DfT) by providing technical advice to support their future management of the SS Richard Montgomery.

The aim of this report is to summarise the most recent work carried out by Dstl and to describe potential future research tasks and associated considerations.

### Key findings

A previous report (DSTL/CR90425 dated 7 Aug 15) described work completed during FY 14/15 ("Phase 1"). Following the recommendations from that phase of the work, Phase 2 was carried out. The key focus of Phase 2 was the prioritisation of the tasks associated with establishing the probability of detonation.

This work is seeking to support DfT's objective to quantify the likelihood of most or all of the munitions on board the SS Richard Montgomery detonating in one event. Previous work had developed a methodology for determining the probability of detonation of the vessel's cargo, the methodology comprising a number of tasks. Phase 2, the subject of this report, sought to prioritise the tasks identified in Phase 1 by determining the most cost effective approach, i.e. which tasks should be completed and in what order to provide the greatest improvement in understanding the probability of detonation. This work was carried out by a group of experts from across government, industry and academia. The tasks were summarised into a number of work package groups, these comprised:

- Foundation information. Includes literature research and the use of other resources such as the Defence Explosive Ordnance Disposal Technical Information Service. This work informs all other work packages and must be completed first.
- Passive wreck and munitions behaviour. Includes the behaviour of the wreck over time and the response of munitions to forces generated due to wreck collapse/movement.
- Munitions detonation behaviour. Determines the response of munitions to a detonation.

- External factors and threats. Assesses how the wreck may respond to a given outside influence.
- Live munitions tasks and testing. Testing of recovered munitions and/or surrogates to validate probability model.

Three suggested potential courses of action were identified for further consideration:

- Option 1. This would involve further desktop research.
- Option 2. This would result in a detailed survey but would not allow any work on recovered munitions.
- Option 3. This would involve all the tasks above being undertaken, including work on live munitions.

## Conclusions and recommendations

### Conclusions

The main conclusions were that:

*Further work at any level would prove valuable and beneficial improving understanding of the probability of detonation, with increasing benefit as the number of work package groups completed increases.*

*The execution of live munitions tasks would provide important empirical information to validate the models and increase confidence in the assessments.*

*Dstl believes that the work proposed by option 3 would provide the most confidence associated with assessing the probability of detonation, but recognises that this would also incur the greatest cost and involve the highest level of intervention, thus increasing the relative level of risk.*

### Recommendations

The main recommendations were that:

- The future course of action is discussed with the relevant stakeholders in the context of this report and the Phase 1 report.
- Further work should be progressed to assess the risks associated with recovering live munitions. This would inform any future decision on potential recovery of munitions.