**Technical Support – Work Order Specification**

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| **Title: Provision of ONR-RRR-061 - Beyond Design Life Regulatory Expectations for the Substantiation of Structures, Systems and Components Important to Safety - Phase 2** |
| 1. Background to the project

Nuclear facilities contain Structures, Systems and Components (SSC) important to safety and security which are required to operate and perform reliably and predictably throughout their life in service. That is often beyond their design life. SSCs are typically designed to a design life which takes account of the operational demands and expectations throughout that period in order to achieve the performance characteristics. With intervention throughout the design life of SSCs through examination, inspection, maintenance and testing, a level of confidence can be established on which performance expectations are based. When designing SSCs against codes and standards, service life assumptions determine the basis on which materials and components are selected. Often design conservatisms are built in to the codes and standards for SSCs which provide operational margins and beyond design life tolerance. However, SSCs rarely have an unlimited life expectancy and are unlikely to contain materials or components without wear out characteristics which requires consideration when entering beyond design life operations. As such, without an in depth understanding of the design basis of SSCs, there is a risk that when the design life is reached or exceeded, materials or components may deterioration in reliability and performance to the point where either enhanced EIM&T becomes necessary to more closely monitor performance characteristics, re-validation of the SSC design basis may be necessary or replacement becomes necessary |
| 1. SCOPE OF THE SERVICES REQUIRED

The basis of this research project is to establish for SSCs important to safety a regulatory basis on which to determine the adequacy of beyond design life substantiation undertaken by duty holders. The project will identify for different classes and types of SSCs important to safety and security the minimum expectations against which ONR should determine beyond design life considerations have been adequately undertaken when considering the limitations of codes and standards used for such components. The resulting outcome from this project will be providing guidance and information on the questions a duty holder should be expected to have considered and responded to when end of design life is reached for an SSC and where continuation in service is required. The project shall identify specific expectations in response to design life assumptions when exceeded for specific enhanced EIM&T becoming necessary to more closely monitor performance characteristics of vulnerable components. Or identify when re-validation of the SSC design is necessary because of known design standards or code requirements and when no or limited design life extension is justified and replacement becomes essential due to design critical assumptions.The project will be particularly targeted at supporting regulatory principles in considering Periodic Safety Review and the engineering substantiation that underpins safety case justifications.Phase 2 will cover the following objectives as a result of the phase 1 report:* Benchmarking with other high hazard industries predicting, monitoring and managing ageing effects in preserving the reliability and performance for different classes and types of mechanical SSCs important to safety and security
* Identify beyond design life relevant good practice for different classes and types of mechanical SSCs important to safety
* Identify minimum expectations against which ONR should determine beyond design life considerations have been adequately undertaken

Objectives and outputs given in appendix A of contract specification (2018/22984) |
| 1. OBJECTIVES

Phase 1: The output will identify ONR guidance (SAPs, TAGs, etc) on beyond design life regulatory expectations for mechanical SSCs. **Completed****Phase 2**: The research project output will identify beyond design life relevant good practice (RGP) for different classes and types of mechanical SSCs important to safety. Benchmarking of nuclear and other high hazard industries will be undertaken against the ONR guidance identified in phase1. This phase will identify the minimum expectations against which ONR should determine beyond design life considerations have been adequately undertaken when considering the limitations of codes and standards used for such components.**Phase 3**: The output will include drafting a new technical guidance supporting regulatory principles in considering periodic safety review and the engineering substantiation that underpins safety case justification for mechanical SSCs. This shall include but not limited to:* providing guidance and information on the questions a duty holder should be expected to have considered and responded to when end of design life is reached for an SSC and where continuation in service is required.
* identify specific expectations in response to design life assumptions when exceeded for specific enhanced EIM&T becoming necessary to more closely monitor performance characteristics of vulnerable components.
* Or identify when re-validation of the SSC design is necessary because of known design standards or code requirements and when no or limited design life extension is justified and replacement becomes essential due to design critical assumptions.

**Phase 4**: The project output shall include engagement with industry to determine acceptance of new guidance. Note: Phase 3 & 4 will be confirmed after completion of phase 2.  |
| 1. CONSTRAINTS

The supplier shall declare any conflict of interest that arise in delivering this project from previous beyond design life substantiation work undertaken for duty holders which were subject to technical assessment similar in nature to this project.One of the means used by ONR to select the TSC will be by evaluation of submitted CVs. Its envisaged this project shall require a coordinated team approach, with a project manager supported by suitably qualified and experienced representatives from multi-disciplinary who will each hold recognised industry qualifications to underpin their competence and authority to support this project.Individuals shall be able to demonstrate a comprehensive knowledge of reactor design/operation/decommissioning with sufficient relevant technical experience in beyond design life substantiation along with safety case experience in analysing parameters that effect SSCs important to nuclear safety and security. Bidders for this TSC shall submit the CVs of the specialist’s personnel who shall be employed on the project together with the charge rate applicable to their involvement in this project.Nominated personnel whose CVs have been submitted at tender shall only be substituted by prior agreement with ONR.The philosophy in approaching this project is best endeavours to avoid collecting sensitive information that leads to document security classification, with a view to retaining open source status. Separate Annex may be considered is classification above open source becomes necessary. But in delivering the project, it may become appropriate when information gathering or undertaking analysis sensitive nuclear information [confirmed with the Project Officer] is generated and the provider must recognise and respond to such risks. Appropriate IT and security vetting measures may be necessary, and if conceived must first be put in place, as previously communicated to TSCs included in ONRs contracting award.The projecting team may also be required to visit nuclear licensed sites. As such the project team must be able to enter such facilities and meet the security requirements set by duty holders for entry in order to deliver the project.The project provider shall be required to undertake technical audit at each stage independent to the project team to assure the technical basis of the project is robust and well founded. In addition, the project should be subject to independent oversight within the provider’s organisation to ensure objectives and outputs are achieved. Both technical audit and oversight outcomes shall be documented in each end of stage review report.During delivery of this project, the project team may uncover matters which require confidentiality considerations. It is incumbent on the project provider to raise such matters at the earliest opportunity in order to determine the nature of the issue and an adequate response.The material gathered during the course of this project shall be referenced and presented in the end of stage reports. The material will be considered open source and provided in an agreed format complete to ONR. Documents obtained from third parties that retain a security or commercial designation, will be handled in accordance with the requirements set by the owner. |
| 1. CONTRACT MANAGEMENT

ONR will require to be kept updated about progress and delivery of the required work via monthly meetings, to include a contract start-up meeting at ONR’s offices at Bootle. Subsequent progress meeting should be arranged with the ONR Project Office and can be held at ONR’s office in Bootle, or the contractor’s premises. |
| **TECHNICAL RESPONSE** |
| 1. Response

The Technical Response should demonstrate a clear understanding of the work required.Please provide * a description of how you will deliver the scope of work (methodology) and the proposed delivery team you will use, clearly signposting to relevant sections within your Capability Prospectus where appropriate/relevant ;
* a description of proposed deliverables and/or outputs
* an outline of anticipated engagement (project meetings & management)
* details of proposed cost and associated effort assumptions
* a project delivery plan showing activities and milestones
* a planned invoice schedule
* details of any assumptions or constraints
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