

Study group on seismic design of storage tanks - 1999/2000 report



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ABSTRACT: The NZSEE Study Group on Seismic Design of Storage Tanks is working towards publishing a revision to the 1986 Red Book incorporating an amended procedure for determining seismic loads on tanks. Industry Funding from interested parties is being sought to assist the Study Group to complete its work.

1 BACKGROUND

The New Zealand National Society for Earthquake Engineering (NZSEE) Study Group on Seismic Design of Storage Tanks has been working for some time to revise the Society's 1986 Red Book *Recommendations for Seismic Design of Storage Tanks*. The revisions will include a procedure for determining seismic design loads for storage tanks, particularly for steel bulk storage tanks, for which there has been considerable debate and uncertainty about what loads are appropriate to use. The aim is that the revised seismic design recommendations will be more widely accepted by regulatory authorities, owners and design engineers, and will thus provide benefits to the whole industry.

A draft loading scheme has been devised by the Study Group and has been published at the Society's recent annual conferences in summary form and at the recent 12th World Conference on Earthquake Engineering. The loading scheme is based on the design spectra in NZS 4203:1992 with suitable adjustments incorporated for tank behaviour and performance parameters for ductility, damping levels, and risk factors. The scheme is already being used unofficially by some practitioners, and has been embodied in draft regulations written for the Hazardous Substances and New Organisms (HSNO) Act.

The Study Group's work needs to be completed, verified and published.

2 REMAINING TASKS

There are a number of important tasks remaining to be completed before the Study Group recommendations can be published and used widely. These tasks include:

- Benchmarking of proposed seismic loading levels against other relevant international standards.
- Reviewing international data for tank damage and performance.
- Consultating with affected industry parties.
- Finalising loading procedures and parameters.
- Editing and upgrading the 1986 Red Book document to incorporate loading scheme and associated changes.
- Publishing the revised Red Book document.

3 REQUEST FOR INDUSTRY SPONSORSHIP

The Society is seeking funding contributions from the industry to assist the Study Group to complete the revision work. Financial support will allow the work to be carried out in a more timely manner than has been possible to date, due to relying on members contributing their time and expertise on a purely voluntary basis. The invitation to industry presents an opportunity for affected parties to contribute to the revision process and to provide input to the regulations which will ultimately affect the cost and operation of their assets. Funding will allow the benefits of the work to be made available more quickly to the industry.

With suitable funding, it is hoped that the Study Group's work will be able to be completed this year.

4 STUDY GROUP MEMBERSHIP

Members of the Study Group are as follows:

Dr David Whittaker (Convenor)	Beca
Mr Rob Jury	Beca
Dr John Wood	Phillips & Wood
Dr Barry Davidson	University of Auckland
Dr Graeme McVerry	Geological & Nuclear Sciences
Mr John Mason	Sinclair Knight Merz

Interested members and industry organisations are encouraged to participate in the completion and review of the Study Group's work.

5 RETURN TO INDEX

