Executive Summary

This document replaces the 1990 SANCOLD Interim Guidelines on Freeboard for Dams. South Africa has legislation to control the safety of dams. Engineering standards for dams are not prescribed in the legislation. This guideline document is therefore essential to assist not only the designers of new dams but also those charged with evaluating the safety of existing dams.

There is a Volume I report in this series on freeboard which deal with a literature review and case studies. Volume I also provides more information on a risk analysis approach and on the design of riprap for erosion protection against wind generated waves at embankment dams.

The key revisions made in this document are:

a) The Milford wind map was replotted for 1:25, 1:50 and 1:100 year 1 hour duration wind speeds.
b) Wind generated wave heights; run-up and set-up should be based on the Rock Manual for analytical calculations, while the SWAN software is proposed for detailed assessment of wind wave height.
c) The $H_{2\%}$ wind wave (the wave height exceeded by 2% of the waves in an irregular wave train) is proposed in the revised guidelines, which is 1.4 times higher than H_s (the average of the upper third of the wave heights in a wave train) calculated with the 1990 guidelines. This is probably the main difference with the old guideline. (It should be noted that H_{max} (the maximum wave in a wave train) is still 1.4 times higher than $H_{2\%}$).
d) Unsteady flow patterns in reservoirs such as seiches, oscillations, flood surges, land slide waves, etc. should be simulated by mathematical hydrodynamic models.
e) Freeboard combination scenarios based on hazard rating and dam size were revised.