

# DAM SAFETY RISK MANAGEMENT WORKSHOP

## DAM SAFETY INSPECTION SYSTEM



Department of  
Primary Industries  
Office of Water

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# 1 ROLES AND RESPONSIBILITIES OF DAM OWNER

Local Water Utilities (LWUs) are responsible for the continuing safe operation, maintenance, monitoring and inspections of their dams.

The LWUs are also responsible for complying with all relevant legislation and guidelines, particularly:

- the requirements of the Dam Safety Committee (DSC) under the Dam Safety Act;
- the Australian National Committee on Large Dams (ANCOLD) guidelines;
- Section 60 of the Local Government Act for Council owned dams; and
- Work Health and Safety Act 2011.

## 2 ROLES AND RESPONSIBILITIES OF NSW OFFICE OF WATER DAM SAFETY UNIT

The Dam Safety Unit has two roles:

- Statutory Role
- Ensuring And Advisory Role

## Statutory Role

**Under Section 60** of the Local Government Act (1993), the Minister for Primary Industries approval is required for certain works, which include the construction, extension or modification of council owned dams and associated works, where the dams are used for public purposes. Approval is also required for prescribed council flood retention basins.

S60 applications to NOW are referred to the DSC for analysis and review of proposals. Acting on advice and recommendations from the DSC, NOW issues an approval with any necessary conditions, or issues a non-approval.

**Under Section 61 to 63** Local Government Act (1993), the Minister may direct a council to take such measures as required to ensure the safety of dams for impounding or diversion of water for public use and if it became necessary, to undertake the required works and recover the costs from council.





## Ensuring And Advisory Role

The Dam Safety Unit of NOW also assists Local Water Utilities by undertaking periodic inspections of nominated LWU dams at a frequency as determined by the DSC and ANCOLD requirements.

These inspections are undertaken to professional standards, but in no way absolve LWUs from their responsibility for the safe operation maintenance and monitoring of their dams.

Since 2009 the Dam Safety Unit's technical role has been reduced and the Unit no longer provides LWU with detailed technical advice or review of technical issues.



### 3 DAM INSPECTION FRAMEWORK

The dam inspection regime for prescribed dams is set by the Dam Safety Committee, under the Dam Safety Act and the ANCOLD guidelines.

## Consequence Category

The Dam Safety Committee assigns a Consequence Category to dams based on their potential failure consequences. The Consequence Categories replace the older Hazard Rating in the ANCOLD Guidelines.

The Consequence Category is used to determine if the dam needs to be prescribed and the level and frequency of the required surveillance. This to ensure the dam's continuing safety, and the extent and priority for any safety improvement measures as well as the design standards to be met.

There are two types of Consequence Category

**Sunny Day Consequence Category (SDCC)** – failure without a flood eg earthquake or sudden structural failure.

**Flood Consequence Category (FCC)** – failure with an associated flood



The Consequence Categories are classified in seven levels as follows:-

**Extreme**

**High A**

**High B**

**High C**

**Significant**

**Low**

**Very Low**

The higher of the SDCC or FCC is used to determine the need for prescription and the SDCC is usually used for determination of surveillance frequency. For more detail see the DSC website (Guidance Sheet [DSC3A](#)).



# Inspection Types

Below is Table 5.1 from the ANCOLD guidelines that gives details of the various levels of dam inspections.

**TABLE 5.1 DAM SAFETY INSPECTIONS**

Type of Inspection	Personnel	Purpose
Comprehensive	Dams Engineer and Specialists <sup>1</sup> (where relevant)	The identification of deficiencies by a thorough onsite inspection; by evaluating surveillance data; and by applying current criteria and prevailing knowledge. Equipment should be test operated to identify deficiencies. For a Safety Review consider: <ul style="list-style-type: none"> <li>• Draining of outlet works for internal inspection.</li> <li>• Diver inspection of submerged structures.</li> </ul>
Intermediate	Dams Engineer	The identification of deficiencies by visual examination of the dam and review of recent surveillance data, with recommendations for corrective actions. Equipment is inspected and, preferably, test operated.
Routine Visual	Operations Personnel	The identification and reporting of deficiencies by visual observation of the dam by operating personnel as part of their duties at the dam.
Special / Emergency	Dams Engineer and Specialists <sup>1</sup>	The examination of a particular feature of a dam for some special reason (eg. after earthquakes, heavy floods, rapid drawdown, emergency situation) to determine the need for pre-emptive or corrective actions.

(Note1: Examples of specialists include mechanical and electrical engineers, to inspect outlet works, spillway gates and automated systems, and corrosion engineers.)

**Table 1 – FREQUENCY OF INSPECTIONS OF LOCAL WATER UTILITY DAMS**

<b>Inspection Type</b>				
<b>Consequence Category (Note 3)</b>	<b>Comprehensive</b>	<b>Intermediate</b>	<b>Routine Visual</b>	<b>Special</b>
Extreme	On first filling then 5 yearly	<b>Annual</b>	Daily (note 1)	As required
High A, B, C	On first filling then 5 yearly	<b>Annual</b>	Daily to Tri Weekly (note 1)	As required
Significant	On first filling then 5 yearly	<b>Annual to 2 Yearly</b>	Twice Weekly to Weekly (note 1)	As required
Low		<b>On first filling, then 5 yearly</b>	Monthly	As required
Very Low		Dam Owner's	Dam Owner's	As required

**NOTE**

1. This is a modification of Table 5.2 from the ANCOLD Guidelines.
2. Inspections undertaken by NOW Dam Safety Unit shown in **Yellow**

## 4 DAM INSPECTIONS - ROLE OF THE DAM SAFETY UNIT OF NOW

- There are approximately 150 Council owned prescribed dams and of these approximately 100 are inspected, or monitored by the NOW Dam Safety Unit. This includes approximately 55 High Hazard Dams. The Unit does not inspect Very Low Consequence Category Dams, or flood detention basins.
- Dam Safety Unit engineers generally undertake the intermediate inspections of LWU dams as shown in Table 5.1 of the ANCOLD Guidelines (shown on the previous slides) and at a frequency based on the ANCOLD Guidelines and DSC recommendations. Previous Table (see Yellow Highlight).

- The Dam Safety Unit inspections provide both a status report of the dams and recommendations for corrective actions that have been identified.
- These reports provide a general overview of the visual condition of the dams at the time of the inspections. However, it is important to note that these inspections are undertaken to assist the LWU in the safe operation and maintenance of their dams. These reports in no way absolve the LWUs of their responsibilities to monitor and maintain their dams and to identify remedial action as required, as well as complying with all regulatory requirements. These inspections are carried out at no charge to the LWU.

## 5 CHANGES TO THE ROLE OF THE NOW DAM SAFETY UNIT

- Prior to 1990 the Dam Safety Unit provided a technical review and technical advice service for LWUs.
- However, since that time the role of the Dam Safety Program has changed and a detailed technical advice and review service is no longer provided.
- It is now the responsibility of LWUs to engage a dam specialist to provide technical advice, review monitoring data and provide technical information to ensure the safety of their dams and compliance with all regulatory requirements.



## The Dam Safety Unit no longer has a role in:

- the provision of detailed technical advice;
- the review of technical or design reports;
- the preparation or review of Surveillance Reports;
- Dam Safety Emergency Planning (DSEP) - This is to be done in accordance with the requirements of the DSC. All reference to NOW should be removed from the DSEP;
- Operator Training - Training is now administered and delivered by the DSC;
- the provision of Seismic Information – this can be obtained from the Geoscience Australia website (<http://www.ga.gov.au/earthquakes/>)

Although NOW no longer reviews dam technical and safety related reports, LWUs are still required to forward all relevant final reports/documents to NOW for our information. This includes copies of the DSEP, Operations and Maintenance Manuals and all technical reports and design reports. LWUs are also still required to provide monitoring data for our information.

## 6 MONITORING OF DAMS

It is beyond the scope of this presentation to discuss dam monitoring in detail. However, the monitoring and recording of data is an integral part of ensuring the continuing safety and integrity of dams and this must comply with the requirements of the DSC and ANCOLD guidelines.

It is also essential that LWU dam operations personnel immediately report any “*other than normal observations*” in the dam’s performance and/or physical condition to the Council’s dam specialist and to the DSC Executive Engineer. The Manager Dam Safety Unit of NOW should also be informed.

QUESTIONS?



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