



Dam Safety Compliance & Performance Report 2014/15

Name of dam: **Corin Dam**

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Completing the annual report

A regulated utility owning, leasing or subleasing a dam listed under Section 69 of the Utilities (Technical Regulation) Act 2014 (the Act) is required under Section 6.2 of the Dam Safety Code 2015 to provide a written report annually to the Technical Regulator for that dam. The content and format of each report is as specified in this Excel workbook and the accompanying "Dam Safety Compliance & Performance Report - 2014/15 - Dictionary" document. Information provided in this Annual Compliance and Performance Report will be used in the Technical Regulator's report required under s.80 of the Act. The Technical Regulator's report is required to be published.

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Legend and data validation

Legend

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Column heading
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Enter qualitative data in these cells
Enter quantitative data in these cells
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General responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.
The authorising officer may use an electronic signature.

Each regulated utility need answer the "General response" questions on this sheet only once each year. If the information has already been supplied in the questionnaire for another dam, it need not be supplied again here - instead please indicate in which dam's questionnaire these questions have been answered:

Yes

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
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General

DS1	a	Corporate Approval (Y/N?)	
DS1	b	Authorising officer name	
DS1	c	Authorising officer title / position	
DS1	d	Authorising officer signature	

Management of DSMSs

DS2	a	Responsible officer title	
DS2	b	Office for reporting title	
DS2	c	Qualifications and experience required	
DS2	d	Qualifications and experience actual	
DS2	e	Documentation of responsibilities (Y/N?)	

Quality management of Dam Safety Management Systems (DSMSs)

DS3	a	Function level audit(Y/N?)	
DS3	b	Process and Validation level audits (Y/N?)	

Training for dam safety

DS4	a	Training of personnel (Y/N?)	
DS4	b	Positions trained (list)	
DS4	c	Training dates (list)	
DS4	d	Positions not trained (list)	

DSMS Documents

DS5		Archiving of documents (Y/N?)	
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Unscheduled and new dams

DS6	a	Unscheduled dams current (Y/N?)	
DS6	b	Unscheduled dams future (Y/N?)	



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Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
Data file			
DS7	a	Data file (Y/N?)	Yes
DS7	b	Data book (Y/N?)	Yes
Sunny Day Classification			
DS8	a	Sunny Day Consequence category	Extreme
DS8	b	Sunny Day Consequence basis ("PAR", "PLL" or "other")	PLL
DS8	c	Sunny Day Consequence value (value or consideration)	127
DS8	d	Sunny Day Consequence review date (date)	5/09/2012
DS8	e	Sunny Day Consequence next review (date/"Not Planned")	Not Planned
DS8	f	Sunny Day Consequence change (Y/N?)	No
Flood Consequence Classification			
DS9	a	Flood Consequence category	High A
DS9	b	Flood Consequence category basis ("PAR", "PLL" or "other")	PLL
DS9	c	Flood Consequence category (value or consideration)	48
DS9	d	Flood Consequence category review date (date)	5/09/2012
DS9	e	Flood Consequence category next review (date/"Not Planned")	Not Planned
DS9	f	Flood Consequence category change (Y/N?)	No
Operation and maintenance manuals			
DS10	a	O&M manual exists(Y/N?)	Yes
DS10	b	Date of most recent O&M manual revision?	April 2013
DS10	c	O&M manual is a controlled document (Y/N?)	No
DS10	d	O&M log (Y/N?)	Yes
Operations issues - Flood			
DS11	a	DCF – headwater level (m)	Reduced Level 962.56 m (AHD)
DS11	b	DCF –discharge	1540 cu.m/s (wave wall top)
DS11	c	DCF – AEP	1:1,000,000
DS11	d	Safe Flood Capacity – level (m)	RL 962.56 m (AHD)
DS11	e	Safe Flood Capacity - discharge	1540 Cu. m/s
DS11	f	Safe Flood Capacity ("AEP"/"PMPDF"/"PMF")	AEP
DS11	g	Safe Flood Capacity (value of AEP/PMPDF/PMF)	1:1,000,000
DS11	h	Flood capacity (citation)	Cotter River Dams Flood Risk Studies V3-5-09-2012 by SKM

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS11	i	Flood events (#)	0
DS11	j	Worst Flood – date	8/04/2015
DS11	k	Worst Flood – peak inflow	15 Cu. m/s
DS11	l	Worst Flood – peak outflow	0
DS11	m	Worst Flood – peak headwater	0
Operations issues - Earthquake			
DS12	a	Safe earthquake - PGA	0.38g
DS12	b	Safe earthquake - AEP	1 in 50000
DS12	c	Earthquake capacity (citation)	Comprehensive Surveillance report - Corin Dam, May 2012 by ActewAGL.
DS12	d	Earthquake (#)	No events greater than (MMI) IV
DS12	e	Earthquake – date/“No Event”	No Event
DS12	f	Earthquake – intensity/“No Event”	No Event
DS12	g	Earthquake – shaking measured (state/“No Event”)	No Event
Operations issues - General			
DS13		Operating problems (Y/N?)	Yes
Maintenance performance			
DS14	a	Maintenance record (Y/N?)	Yes
DS14	b	Deferred Maintenance (Y/N?)	No
Inspection of dams			
DS15	a	Inspection regime (Y/N?)	Yes
DS15	b	Inspection frequency (Y/N?)	Yes
DS15	c	Inspection reports to suit dam (Y/N?)	Yes
DS15	d	Inspection reports minimum content (Y/N?)	Yes
DS15	e	Special/Emergency inspections (Y/N?)	No
DS15	f	Completion of inspections (Y/N?)	Yes
DS15	g	Inspection reports signed (Y/N?)	Yes
Surveillance reports			
DS16	a	Dam surveillance program submission (date)	29/10/2014
DS16	b	Latest Surveillance Report (citation)	Corin Dam - Comprehensive Surveillance Report -2012.
DS16	c	Content of Surveillance Reports (Y/N?)	Yes
DS16	d	[Question for NSW Scheduled dams only]	
DS16	e	[Question for NSW Scheduled dams only]	
Instrumentation			
DS17	a	Available instrumentation (list)	Leakage weirs, Ground water holes, Seismometer, Accelerometer, Water Level sensors, Deformation targets, rainfall gauge
DS17	b	Calibration of instrumentation (Y/N?)	Yes
Monitoring of dams			
DS18	a	Monitoring undertaken (describe)	Deformation survey, Leakage, Ground water hole measurement, Seismometer monitoring, Water level, Inflows, Outflows, Rainfall

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS18	b	Frequency of monitoring (Y/N?)	Yes
DS18	c	Monitoring of anchors (Y/N/"No Anchors"?)	No
DS18	d	Mechanical/electrical monitoring (Y/N?)	Yes
DS18	e	Monitoring records archived (Y/N?)	Yes
Surveillance evaluation			
DS19	a	Surveillance evaluation – personnel	Yes
DS19	b	Surveillance evaluation – frequency	Yes
DS19	c	Surveillance evaluation (Y/N?)	Yes
Safety review			
DS20	a	Latest safety review - date	5/09/2012
DS20	b	Peer reviewed comprehensive safety review (Y/N?)	No
DS20	c	Safety Review Report (citation)	Cotter River Dams Flood Risk Studies V3-5-09-2012 by SKM
DS20	d	Corresponding Separate Peer review Report (citation)	Not available
DS20	e	Peer reviewed comprehensive safety review – availability	Not planned
DS20	f	[Question for NSW Scheduled dams only]	
DS20	g	[Question for NSW Scheduled dams only]	
Dam safety emergency plans			
DS21	a	DSEP exists (Y/N?)	Yes
DS21	b	Date of latest DSEP update (citation)	15-06-15, Dam Safety Emergency Plan- Cotter River dams Version1 - 2015, EN 2.3.7
DS21	c	Latest DSEP test (citation)	Exercise " Fish Belly" for Googong and Scrivener Dams on 26-08-14
DS21	d	Draft DSEP submission (date)	15/06/2015
DS21	e	Inundation mapping data submission (date)	15/06/2015
DS21	f	Inundation mapping data start (co-ordinates)	666406E, 6066108N
DS21	g	Inundation mapping data end (co-ordinates)	644561E, 6125626N
DS21	h	Inundation mapping data submission sheets (#)	11
DS21	i	DSEP contact list submission (date)	15/06/2015
DS21	j	Dam emergency event report submission (Y/N?)	No
Security of dams			
DS22	a	Security plan (Y/N?)	Yes
DS22	b	Security plan test/review (date)	9-12-14
DS22	c	Security assessment (date)	Actew Corporation Security Management Plan 2014
Dam safety incidents			
DS23		Dam safety incidents (Y/N?)	No
Dam safety developments			
DS24	a	Developments affecting dam safety (Y/N?)	No
DS24	b	Effect of any other dam (Y/N?)	No
Modification of dams			
DS25	a	Dam modifications (Y/N?)	No

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS25	b	Improvement due to modifications (Y/N/"No Modification"?)	No Modification
Key documents			
DS26	a	Design reports or safety reviews (Y/N?)	Yes
DS26	b	Safety reviews (citation)	Refer to Supplementary Information
DS26	c	Construction reports (Y/N?)	Yes
DS26	d	WAE drawings (Y/N?)	Yes
DS26	e	Safety status ("A", "B" or "C")	A



Dam Safety Compliance & Performance Report 2014/15

Name of dam: **Bendora Dam**

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Yes

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
General			
DS1	a	Corporate Approval (Y/N?)	
DS1	b	Authorising officer name	
DS1	c	Authorising officer title / position	
DS1	d	Authorising officer signature	
Management of DSMSs			
DS2	a	Responsible officer title	
DS2	b	Office for reporting title	
DS2	c	Qualifications and experiencerequired	
DS2	d	Qualifications and experience actual	
DS2	e	Documentation of responsibilities (Y/N?)	
Quality management of Dam Safety Management Systems (DSMSs)			
DS3	a	Function level audit(Y/N?)	
DS3	b	Process and Validation level audits (Y/N?)	

Training for dam safety

DS4	a	Training of personnel (Y/N?)	
DS4	b	Positions trained (list)	
DS4	c	Training dates (list)	
DS4	d	Positions not trained (list)	

DSMS Documents

DS5		Archiving of documents (Y/N?)	
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Unscheduled and new dams

DS6	a	Unscheduled dams current (Y/N?)	
DS6	b	Unscheduled dams future (Y/N?)	



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Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
Data file			
DS7	a	Data file (Y/N?)	Yes
DS7	b	Data book (Y/N?)	Yes
Sunny Day Classification			
DS8	a	Sunny Day Consequence category	High A
DS8	b	Sunny Day Consequence basis ("PAR", "PLL" or "other")	PLL
DS8	c	Sunny Day Consequence value (value or consideration)	2
DS8	d	Sunny Day Consequence review date (date)	5/09/2012
DS8	e	Sunny Day Consequence next review (date/"Not Planned")	Not planned
DS8	f	Sunny Day Consequence change (Y/N?)	No
Flood Consequence Classification			
DS9	a	Flood Consequence category	High A
DS9	b	Flood Consequence category basis ("PAR", "PLL" or "other")	PLL
DS9	c	Flood Consequence category (value or consideration)	16
DS9	d	Flood Consequence category review date (date)	5/09/2012
DS9	e	Flood Consequence category next review (date/"Not Planned")	Not planned
DS9	f	Flood Consequence category change (Y/N?)	No
Operation and maintenance manuals			
DS10	a	O&M manual exists(Y/N?)	Yes
DS10	b	Date of most recent O&M manual revision?	Apr-13
DS10	c	O&M manual is a controlled document (Y/N?)	No
DS10	d	O&M log (Y/N?)	Yes
Operations issues - Flood			
DS11	a	DCF – headwater level (m)	Reduced level 782.77 m AHD
DS11	b	DCF –discharge	1550 Cu.m/s
DS11	c	DCF – AEP	1:230,000
DS11	d	Safe Flood Capacity – level (m)	Reduced level 782.77 m AHD
DS11	e	Safe Flood Capacity - discharge	1550 Cu.m/s
DS11	f	Safe Flood Capacity ("AEP"/"PMPDF"/"PMF")	AEP
DS11	g	Safe Flood Capacity (value of AEP/PMPDF/PMF)	1: 230,000
DS11	h	Flood capacity (citation)	See supplementary information

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS11	i	Flood events (#)	0
DS11	j	Worst Flood – date	27/07/2014
DS11	k	Worst Flood – peak inflow	10 Cu.m/s
DS11	l	Worst Flood – peak outflow	6.5 Cu. m/s
DS11	m	Worst Flood – peak headwater	RL 778.627 m AHD
Operations issues - Earthquake			
DS12	a	Safe earthquake - PGA	0.28g
DS12	b	Safe earthquake - AEP	1:10,000
DS12	c	Earthquake capacity (citation)	Bendora Dam Review of Stability- NSW Dept. of Commerce - April 2008
DS12	d	Earthquake (#)	No events greater than (MMI) IV
DS12	e	Earthquake – date/“No Event”	No event
DS12	f	Earthquake – intensity/“No Event”	No event
DS12	g	Earthquake – shaking measured (state/“No Event”)	No event
Operations issues - General			
DS13		Operating problems (Y/N?)	Yes
Maintenance performance			
DS14	a	Maintenance record (Y/N?)	No
DS14	b	Deferred Maintenance (Y/N?)	No
Inspection of dams			
DS15	a	Inspection regime (Y/N?)	Yes
DS15	b	Inspection frequency (Y/N?)	No
DS15	c	Inspection reports to suit dam (Y/N?)	Yes
DS15	d	Inspection reports minimum content (Y/N?)	Yes
DS15	e	Special/Emergency inspections (Y/N?)	No
DS15	f	Completion of inspections (Y/N?)	Yes
DS15	g	Inspection reports signed (Y/N?)	Yes
Surveillance reports			
DS16	a	Dam surveillance program submission (date)	29/10/2014
DS16	b	Latest Surveillance Report (citation)	Bendora Dam - Comprehensive Surveillance Report -2012.
DS16	c	Content of Surveillance Reports (Y/N?)	Yes
DS16	d	[Question for NSW Scheduled dams only]	
DS16	e	[Question for NSW Scheduled dams only]	
Instrumentation			
DS17	a	Available instrumentation (list)	Leakage weirs,ground water holes, Water level sensors, deformation targets, rainfall gauge, joint meters
DS17	b	Calibration of instrumentation (Y/N?)	Yes
Monitoring of dams			
DS18	a	Monitoring undertaken (describe)	Deformation survey, leakage, ground water hole measurement, joint meters, water level, Inflows, outflows, rainfall and visual inspections

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS18	b	Frequency of monitoring (Y/N?)	Yes
DS18	c	Monitoring of anchors (Y/N/"No Anchors"?)	No Anchors
DS18	d	Mechanical/electrical monitoring (Y/N?)	Yes
DS18	e	Monitoring records archived (Y/N?)	Yes
Surveillance evaluation			
DS19	a	Surveillance evaluation – personnel	Yes
DS19	b	Surveillance evaluation – frequency	Yes
DS19	c	Surveillance evaluation (Y/N?)	Yes
Safety review			
DS20	a	Latest safety review - date	5/09/2012
DS20	b	Peer reviewed comprehensive safety review (Y/N?)	No
DS20	c	Safety Review Report (citation)	See supplementary information
DS20	d	Corresponding Separate Peer review Report (citation)	Not available
DS20	e	Peer reviewed comprehensive safety review – availability	Not planned
DS20	f	[Question for NSW Scheduled dams only]	
DS20	g	[Question for NSW Scheduled dams only]	
Dam safety emergency plans			
DS21	a	DSEP exists (Y/N?)	Yes
DS21	b	Date of latest DSEP update (citation)	Dam Safety Emergency Plan- Cotter River Dams Version1 - 2015, EN 2.3.7
DS21	c	Latest DSEP test (citation)	Exercise " Fish Belly" on Googong & Scrivener dams on 26-08-14
DS21	d	Draft DSEP submission (date)	15/06/2015
DS21	e	Inundation mapping data submission (date)	15/06/2015
DS21	f	Inundation mapping data start (co-ordinates)	666406E, 6066108N
DS21	g	Inundation mapping data end (co-ordinates)	644561E, 6125626N
DS21	h	Inundation mapping data submission sheets (#)	11
DS21	i	DSEP contact list submission (date)	15/06/2015
DS21	j	Dam emergency event report submission (Y/N?)	No
Security of dams			
DS22	a	Security plan (Y/N?)	Yes
DS22	b	Security plan test/review (date)	9/12/2014
DS22	c	Security assessment (date)	ACTEW Corporation Security Management Plan-2014
Dam safety incidents			
DS23		Dam safety incidents (Y/N?)	No
Dam safety developments			
DS24	a	Developments affecting dam safety (Y/N?)	No
DS24	b	Effect of any other dam (Y/N?)	No
Modification of dams			
DS25	a	Dam modifications (Y/N?)	No

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS25	b	Improvement due to modifications (Y/N/"No Modification"?)	No Modification
Key documents			
DS26	a	Design reports or safety reviews (Y/N?)	Yes
DS26	b	Safety reviews (citation)	Review of Stability by NSW Dept. of Commerce- April 2008, Review of stability of Right Abutment by NSW Dept. of Commerce- April 2008, Cotter river dams Flood risk studies by SKM 5-09-2012,
DS26	c	Construction reports (Y/N?)	No
DS26	d	WAE drawings (Y/N?)	Yes
DS26	e	Safety status ("A", "B" or "C")	A



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Supplementary information

Note: Please reference each item with the relevant question.



Tip : Press Alt-Enter to start a new line in a cell.

Number	Part	Regulated Utility 2014/15 Response
	General response	Answers to general response section provided in Googong Dam questionnaire.
DS 11	h	'Revision of Design Flood Estimates for Corin, Bendora and Enlarged Cotter Dams by SKM, 24-07-2012.
DS 13		Valve 7, gate valve located on the outlet pipe connecting the discharge cone valve developed a crack along the body causing a leak along the side. Water from Bendora dam is being released through the right side riser. This issue is being currently dealt with an isolation of the entire left delivery pipe in order to remove the damaged valve and replace with a new valve. Impact on the delivery of water from the dam is not significant.
DS 14	b	<ol style="list-style-type: none"> 1. Repairs to damaged conduit on the crest - Raised a maintenance task (190956), due date 30 June 2016. 2. Replace the lights with water proof fittings at two bottom levels in the tower - Raised a maintenance task (190957), due date 30 June 2016. 3. Remove rubbish at the intake tower floor - Raised a maintenance task (190958), due date 30 June 2016. 4. Corrosion on the brackets and accumulation of sand and water in the bracket pocket- Raised a maintenance task (190959), due date 30 June 2016 5. Bund associated with the diesel generator may not capture spills - action being considered 6 Remove single rock from the rock face - Included in the Asset Management Plan for 17/18 7. Provide safe access to survey pillar at the rock slab at Right abutment- Included in the Asset Management Plan for 17/18. 8 Replacing the vertical ladder system with a stairway system- Investigations being carried out 9. Valve actuators in the intake tower no longer supported. - Will be considered in the next cycle of asset management planning.
DS15	b	Routine visual inspections commenced 3 days a week from June 2015 in accordance with ANCOLD Table 5.2
DS18	c	No monitorable anchors



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Name of dam: **Cotter Dam**

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DS1	b	Authorising officer name	
DS1	c	Authorising officer title / position	
DS1	d	Authorising officer signature	

Management of DSMSs

DS2	a	Responsible officer title	
DS2	b	Office for reporting title	
DS2	c	Qualifications and experiencerequired	
DS2	d	Qualifications and experience actual	
DS2	e	Documentation of responsibilities (Y/N?)	

Quality management of Dam Safety Management Systems (DSMSs)

DS3	a	Function level audit(Y/N?)	
DS3	b	Process and Validation level audits (Y/N?)	

Training for dam safety

DS4	a	Training of personnel (Y/N?)	
DS4	b	Positions trained (list)	
DS4	c	Training dates (list)	
DS4	d	Positions not trained (list)	

DSMS Documents

DS5		Archiving of documents (Y/N?)	
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Unscheduled and new dams

DS6	a	Unscheduled dams current (Y/N?)	
DS6	b	Unscheduled dams future (Y/N?)	



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DS7	b	Data book (Y/N?)	Yes
Sunny Day Classification			
DS8	a	Sunny Day Consequence category	Extreme
DS8	b	Sunny Day Consequence basis ("PAR", "PLL" or "other")	PLL
DS8	c	Sunny Day Consequence value (value or consideration)	129
DS8	d	Sunny Day Consequence review date (date)	5/09/2012
DS8	e	Sunny Day Consequence next review (date/"Not Planned")	Not Planned
DS8	f	Sunny Day Consequence change (Y/N?)	No
Flood Consequence Classification			
DS9	a	Flood Consequence category	High A
DS9	b	Flood Consequence category basis ("PAR", "PLL" or "other")	PLL
DS9	c	Flood Consequence category (value or consideration)	84
DS9	d	Flood Consequence category review date (date)	5/09/2012
DS9	e	Flood Consequence category next review (date/"Not Planned")	Not Planned
DS9	f	Flood Consequence category change (Y/N?)	No
Operation and maintenance manuals			
DS10	a	O&M manual exists(Y/N?)	Yes
DS10	b	Date of most recent O&M manual revision?	26/05/2014
DS10	c	O&M manual is a controlled document (Y/N?)	No
DS10	d	O&M log (Y/N?)	Yes
Operations issues - Flood			
DS11	a	DCF – headwater level (m)	Reduced Level 557.4m AHD
DS11	b	DCF –discharge	4480 Cu.m/s
DS11	c	DCF – AEP	1:2,100,000
DS11	d	Safe Flood Capacity – level (m)	Reduced Level 558.3m AHD
DS11	e	Safe Flood Capacity - discharge	5670 Cu.m/s
DS11	f	Safe Flood Capacity ("AEP"/"PMPDF"/"PMF")	PMF
DS11	g	Safe Flood Capacity (value of AEP/PMPDF/PMF)	less than AEP 1: 5,000,000
DS11	h	Flood capacity (citation)	Refer to supplementary information

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS11	i	Flood events (#)	0
DS11	j	Worst Flood – date	26/07/2014
DS11	k	Worst Flood – peak inflow	9 Cu.m/s
DS11	l	Worst Flood – peak outflow	0
DS11	m	Worst Flood – peak headwater	0
Operations issues - Earthquake			
DS12	a	Safe earthquake - PGA	0.35g
DS12	b	Safe earthquake - AEP	1:10,000
DS12	c	Earthquake capacity (citation)	2014
DS12	d	Earthquake (#)	No event greater than (MMI) IV
DS12	e	Earthquake – date/“No Event”	No Event
DS12	f	Earthquake – intensity/“No Event”	No Event
DS12	g	Earthquake – shaking measured (state/“No Event”)	No Event
Operations issues - General			
DS13		Operating problems (Y/N?)	No
Maintenance performance			
DS14	a	Maintenance record (Y/N?)	Yes
DS14	b	Deferred Maintenance (Y/N?)	Yes
Inspection of dams			
DS15	a	Inspection regime (Y/N?)	Yes
DS15	b	Inspection frequency (Y/N?)	Yes
DS15	c	Inspection reports to suit dam (Y/N?)	Yes
DS15	d	Inspection reports minimum content (Y/N?)	Yes
DS15	e	Special/Emergency inspections (Y/N?)	No
DS15	f	Completion of inspections (Y/N?)	Yes
DS15	g	Inspection reports signed (Y/N?)	Yes
Surveillance reports			
DS16	a	Dam surveillance program submission (date)	29/10/2014
DS16	b	Latest Surveillance Report (citation)	Cotter Dam - Annual Surveillance Report -Actew Water 2014.
DS16	c	Content of Surveillance Reports (Y/N?)	Yes
DS16	d	[Question for NSW Scheduled dams only]	
DS16	e	[Question for NSW Scheduled dams only]	
Instrumentation			
DS17	a	Available instrumentation (list)	Leakage weirs,Ground water holes, Seismometer, Accelerometer, Water Level sensors, Deformation targets, rainfall gauge, Tilt meters, Piezometers, Joint meters, Relief drains, Extensometers, Thermocouples, Demec studs
DS17	b	Calibration of instrumentation (Y/N?)	Yes
Monitoring of dams			
DS18	a	Monitoring undertaken (describe)	All above instruments listed in DS17 a.

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS18	b	Frequency of monitoring (Y/N?)	Yes
DS18	c	Monitoring of anchors (Y/N/"No Anchors"?)	No Anchors
DS18	d	Mechanical/electrical monitoring (Y/N?)	Yes
DS18	e	Monitoring records archived (Y/N?)	Yes
Surveillance evaluation			
DS19	a	Surveillance evaluation – personnel	Yes
DS19	b	Surveillance evaluation – frequency	Yes
DS19	c	Surveillance evaluation (Y/N?)	Yes
Safety review			
DS20	a	Latest safety review - date	The dam was designed and Constructed in 2013.
DS20	b	Peer reviewed comprehensive safety review (Y/N?)	Yes
DS20	c	Safety Review Report (citation)	Detailed Design Report - Volume 1 - Bulk Water Alliance - March 2014
DS20	d	Corresponding Separate Peer review Report (citation)	Detailed Design Report - Volume 2 - Bulk Water Alliance - March 2014 (Technical Review Panel reports)
DS20	e	Peer reviewed comprehensive safety review – availability	Safety Review not planned
DS20	f	[Question for NSW Scheduled dams only]	
DS20	g	[Question for NSW Scheduled dams only]	
Dam safety emergency plans			
DS21	a	DSEP exists (Y/N?)	Yes
DS21	b	Date of latest DSEP update (citation)	Dam Safety Emergency Plan- Googong Dam Version 1 - 2015, EN 2.3.6
DS21	c	Latest DSEP test (citation)	Exercise "Fish Belly" on Googong & Scrivener dams on 26-08-14
DS21	d	Draft DSEP submission (date)	15/06/2015
DS21	e	Inundation mapping data submission (date)	15/06/2015
DS21	f	Inundation mapping data start (co-ordinates)	666406E,6066108N
DS21	g	Inundation mapping data end (co-ordinates)	644561E, 6125626N
DS21	h	Inundation mapping data submission sheets (#)	11
DS21	i	DSEP contact list submission (date)	15/06/2015
DS21	j	Dam emergency event report submission (Y/N?)	No
Security of dams			
DS22	a	Security plan (Y/N?)	Yes
DS22	b	Security plan test/review (date)	9-12-14
DS22	c	Security assessment (date)	Actew Corporation Security Management plan-2014
Dam safety incidents			
DS23		Dam safety incidents (Y/N?)	Yes
Dam safety developments			
DS24	a	Developments affecting dam safety (Y/N?)	No
DS24	b	Effect of any other dam (Y/N?)	No
Modification of dams			
DS25	a	Dam modifications (Y/N?)	No

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS25	b	Improvement due to modifications (Y/N/"No Modification"?)	No Modification
Key documents			
DS26	a	Design reports or safety reviews (Y/N?)	Yes
DS26	b	Safety reviews (citation)	Detailed design reports Volume1 & 2 BWA - March 2014
DS26	c	Construction reports (Y/N?)	Yes
DS26	d	WAE drawings (Y/N?)	Yes
DS26	e	Safety status ("A", "B" or "C")	A



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Dam Safety Compliance & Performance Report 2014/15

Name of dam: Lower Molonglo Bypass dam

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Completing the annual report

A regulated utility owning, leasing or subleasing a dam listed under Section 69 of the Utilities (Technical Regulation) Act 2014 (the Act) is required under Section 6.2 of the Dam Safety Code 2015 to provide a written report annually to the Technical Regulator for that dam. The content and format of each report is as specified in this Excel workbook and the accompanying "Dam Safety Compliance & Performance Report - 2014/15 - Dictionary" document. Information provided in this Annual Compliance and Performance Report will be used in the Technical Regulator's report required under s.80 of the Act. The Technical Regulator's report is required to be published.

Instructions for completing this report:

- 1 Please refer to the explanatory notes provided on the first page of the accompanying "Dam Safety Compliance & Performance Report - 2014/15 - Dictionary" document.
- 2 Please indicate where material provided is confidential and not for general public release.
- 3 Completed annual reports must be received by the Technical Regulator by 30 September of the year of issue.
- 4 For enquiries please email techregulator.utilities@act.gov.au or call (02) 6207 0362

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Column heading
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Notes for completing questions
Link to another page



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Completing the annual report

General responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

The authorising officer may use an electronic signature.

Each regulated utility need answer the "General response" questions on this sheet only once each year. If the information has already been supplied in the questionnaire for another dam, it need not be supplied again here - instead please indicate in which dam's questionnaire these questions have been answered:

Yes

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
General			
DS1	a	Corporate Approval (Y/N?)	
DS1	b	Authorising officer name	
DS1	c	Authorising officer title / position	
DS1	d	Authorising officer signature	
Management of DSMSs			
DS2	a	Responsible officer title	
DS2	b	Office for reporting title	
DS2	c	Qualifications and experience required	
DS2	d	Qualifications and experience actual	
DS2	e	Documentation of responsibilities (Y/N?)	
Quality management of Dam Safety Management Systems (DSMSs)			
DS3	a	Function level audit(Y/N?)	
DS3	b	Process and Validation level audits (Y/N?)	

Training for dam safety

DS4	a	Training of personnel (Y/N?)	
DS4	b	Positions trained (list)	
DS4	c	Training dates (list)	
DS4	d	Positions not trained (list)	

DSMS Documents

DS5		Archiving of documents (Y/N?)	
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Unscheduled and new dams

DS6	a	Unscheduled dams current (Y/N?)	
DS6	b	Unscheduled dams future (Y/N?)	



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Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
Data file			
DS7	a	Data file (Y/N?)	Yes
DS7	b	Data book (Y/N?)	Yes
Sunny Day Classification			
DS8	a	Sunny Day Consequence category	Low
DS8	b	Sunny Day Consequence basis ("PAR", "PLL" or "other")	PAR
DS8	c	Sunny Day Consequence value (value or consideration)	0
DS8	d	Sunny Day Consequence review date (date)	1994
DS8	e	Sunny Day Consequence next review (date/"Not Planned")	Not Planned
DS8	f	Sunny Day Consequence change (Y/N?)	No
Flood Consequence Classification			
DS9	a	Flood Consequence category	Low
DS9	b	Flood Consequence category basis ("PAR", "PLL" or "other")	PAR
DS9	c	Flood Consequence category (value or consideration)	0
DS9	d	Flood Consequence category review date (date)	1994
DS9	e	Flood Consequence category next review (date/"Not Planned")	Not Planned
DS9	f	Flood Consequence category change (Y/N?)	No
Operation and maintenance manuals			
DS10	a	O&M manual exists(Y/N?)	Yes
DS10	b	Date of most recent O&M manual revision?	April 2013
DS10	c	O&M manual is a controlled document (Y/N?)	No
DS10	d	O&M log (Y/N?)	Yes
Operations issues - Flood			
DS11	a	DCF – headwater level (m)	Reduced Level 482.5 m AHD
DS11	b	DCF –discharge	Not available - See Note DS 11b
DS11	c	DCF – AEP	Not available - See Note DS 11b
DS11	d	Safe Flood Capacity – level (m)	Reduced Level 482.5m (AHD)
DS11	e	Safe Flood Capacity - discharge	Greater than 50 Cu.m/s
DS11	f	Safe Flood Capacity ("AEP"/"PMPDF"/"PMF")	AEP
DS11	g	Safe Flood Capacity (value of AEP/PMPDF/PMF)	Less than 1:10,000
DS11	h	Flood capacity (citation)	Design Report DSU94/02-1994

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS11	i	Flood events (#)	0
DS11	j	Worst Flood – date	N/A
DS11	k	Worst Flood – peak inflow	N/A
DS11	l	Worst Flood – peak outflow	N/A
DS11	m	Worst Flood – peak headwater	N/A
Operations issues - Earthquake			
DS12	a	Safe earthquake - PGA	0.257g
DS12	b	Safe earthquake - AEP	See supplementary information
DS12	c	Earthquake capacity (citation)	Design Report - Bypass Storage Dam-January 1994 by ACTEW Dam Safety
DS12	d	Earthquake (#)	No Events greater than (MMI) IV
DS12	e	Earthquake – date/“No Event”	No event
DS12	f	Earthquake – intensity/“No Event”	No event
DS12	g	Earthquake – shaking measured (state/“No Event”)	No event
Operations issues - General			
DS13		Operating problems (Y/N?)	No
Maintenance performance			
DS14	a	Maintenance record (Y/N?)	No
DS14	b	Deferred Maintenance (Y/N?)	No
Inspection of dams			
DS15	a	Inspection regime (Y/N?)	Yes
DS15	b	Inspection frequency (Y/N?)	Yes
DS15	c	Inspection reports to suit dam (Y/N?)	Yes
DS15	d	Inspection reports minimum content (Y/N?)	Yes
DS15	e	Special/Emergency inspections (Y/N?)	No
DS15	f	Completion of inspections (Y/N?)	Yes
DS15	g	Inspection reports signed (Y/N?)	Yes
Surveillance reports			
DS16	a	Dam surveillance program submission (date)	29/10/2014
DS16	b	Latest Surveillance Report (citation)	LM Bypass Dam - Comprehensive Surveillance Report -2011.
DS16	c	Content of Surveillance Reports (Y/N?)	Yes
DS16	d	[Question for NSW Scheduled dams only]	
DS16	e	[Question for NSW Scheduled dams only]	
Instrumentation			
DS17	a	Available instrumentation (list)	Leakage weirs, Piezometers, Ground water holes, Water Level sensors, Deformation targets, Rainfall gauge
DS17	b	Calibration of instrumentation (Y/N?)	Yes
Monitoring of dams			
DS18	a	Monitoring undertaken (describe)	Deformation survey, Leakage, Piezometer reading, Ground water hole measurement, Water level, Rainfall

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS18	b	Frequency of monitoring (Y/N?)	Yes
DS18	c	Monitoring of anchors (Y/N/"No Anchors"?)	No Anchors
DS18	d	Mechanical/electrical monitoring (Y/N?)	Yes
DS18	e	Monitoring records archived (Y/N?)	Yes
Surveillance evaluation			
DS19	a	Surveillance evaluation – personnel	Yes
DS19	b	Surveillance evaluation – frequency	Yes
DS19	c	Surveillance evaluation (Y/N?)	Yes
Safety review			
DS20	a	Latest safety review - date	No safety Review has been carried out after the construction in 1994. See Note
DS20	b	Peer reviewed comprehensive safety review (Y/N?)	No
DS20	c	Safety Review Report (citation)	As above
DS20	d	Corresponding Separate Peer review Report (citation)	As above
DS20	e	Peer reviewed comprehensive safety review – availability	As above
DS20	f	[Question for NSW Scheduled dams only]	
DS20	g	[Question for NSW Scheduled dams only]	
Dam safety emergency plans			
DS21	a	DSEP exists (Y/N?)	Yes
DS21	b	Date of latest DSEP update (citation)	Dam Safety Emergency Plan- LMWQCC Bypass Dam Version1 - 2015, EN 2.3.5
DS21	c	Latest DSEP test (citation)	Exercise "Fish Belly" on Googong & Scrivener dams on 26-08-14
DS21	d	Draft DSEP submission (date)	15/06/2015
DS21	e	Inundation mapping data submission (date)	15/06/2015
DS21	f	Inundation mapping data start (co-ordinates)	No Inundation mapping -See supplementary information
DS21	g	Inundation mapping data end (co-ordinates)	Not available- See supplementary information DS 21-f
DS21	h	Inundation mapping data submission sheets (#)	Not available - See supplementary information DS21 -f
DS21	i	DSEP contact list submission (date)	15/06/2015
DS21	j	Dam emergency event report submission (Y/N?)	No
Security of dams			
DS22	a	Security plan (Y/N?)	Yes
DS22	b	Security plan test/review (date)	9/12/2014
DS22	c	Security assessment (date)	Actew Corporation Security Management Plan -2014
Dam safety incidents			
DS23		Dam safety incidents (Y/N?)	No
Dam safety developments			
DS24	a	Developments affecting dam safety (Y/N?)	No
DS24	b	Effect of any other dam (Y/N?)	No
Modification of dams			

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS25	a	Dam modifications (Y/N?)	No
DS25	b	Improvement due to modifications (Y/N/"No Modification"?)	No Modification
Key documents			
DS26	a	Design reports or safety reviews (Y/N?)	Yes
DS26	b	Safety reviews (citation)	Draft Design Report DSU94/02-1994 Spillway & Stilling basin design -1993, Flood Frequency Curve for the proposed LMWQCC Bypass dam
DS26	c	Construction reports (Y/N?)	Yes
DS26	d	WAE drawings (Y/N?)	Yes
DS26	e	Safety status ("A", "B" or "C")	A



Dam Safety Compliance & Performance Report 2014/15

Name of dam: **Googong Dam**

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General responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

The authorising officer may use an electronic signature.

Each regulated utility need answer the "General response" questions on this sheet only once each year. If the information has already been supplied in the questionnaire for another dam, it need not be supplied again here - instead please indicate in which dam's questionnaire these questions have been answered:

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
General			
DS1	a	Corporate Approval (Y/N?)	Yes
DS1	b	Authorising officer name	Ray Hezkial
DS1	c	Authorising officer title / position	Acting Chief Executive Officer
DS1	d	Authorising officer signature	
Management of DSMSs			
DS2	a	Responsible officer title	Dam Safety Engineer
DS2	b	Office for reporting title	Manager, Water Asset Planning
DS2	c	Qualifications and experience required	Degree in Civil / Geotechnical engineering and extensive experience in dam safety management
DS2	d	Qualifications and experience actual	B.Sc. Eng, M Eng, MBA, Grad. Dip. LGE, MEA, Chartered Engineer, 42 years of experience in civil engineering with 23 yrs dam specific experience.
DS2	e	Documentation of responsibilities (Y/N?)	Yes
Quality management of Dam Safety Management Systems (DSMSs)			
DS3	a	Function level audit(Y/N?)	Yes

DS3	b	Process and Validation level audits (Y/N?)	Yes
Training for dam safety			
DS4	a	Training of personnel (Y/N?)	Yes
DS4	b	Positions trained (list)	Dam Safety Engineer, Manager Water Asset Planning, Dam Inspectors, Operators, Maintenance staff
DS4	c	Training dates (list)	6-8 May 2015
DS4	d	Positions not trained (list)	None
DSMS Documents			
DS5		Archiving of documents (Y/N?)	Yes
Unscheduled and new dams			
DS6	a	Unscheduled dams current (Y/N?)	Yes
DS6	b	Unscheduled dams future (Y/N?)	No



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Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
Data file			
DS7	a	Data file (Y/N?)	Yes
DS7	b	Data book (Y/N?)	Yes
Sunny Day Classification			
DS8	a	Sunny Day Consequence category	Extreme
DS8	b	Sunny Day Consequence basis ("PAR", "PLL" or "other")	PLL
DS8	c	Sunny Day Consequence value (value or consideration)	887
DS8	d	Sunny Day Consequence review date (date)	30/03/2015
DS8	e	Sunny Day Consequence next review (date/"Not Planned")	Not planned
DS8	f	Sunny Day Consequence change (Y/N?)	No
Flood Consequence Classification			
DS9	a	Flood Consequence category	Extreme
DS9	b	Flood Consequence category basis ("PAR", "PLL" or "other")	PLL
DS9	c	Flood Consequence category (value or consideration)	1113
DS9	d	Flood Consequence category review date (date)	30/03/2015
DS9	e	Flood Consequence category next review (date/"Not Planned")	Not Planned
DS9	f	Flood Consequence category change (Y/N?)	No
Operation and maintenance manuals			
DS10	a	O&M manual exists(Y/N?)	Yes
DS10	b	Date of most recent O&M manual revision?	April 2013
DS10	c	O&M manual is a controlled document (Y/N?)	No
DS10	d	O&M log (Y/N?)	Yes
Operations issues - Flood			
DS11	a	DCF – headwater level (m)	Reduced Level 674.5 m (AHD)
DS11	b	DCF –discharge	10,100 cu.m/s
DS11	c	DCF – AEP	1:1,100,000
DS11	d	Safe Flood Capacity – level (m)	RL 674.5 m (AHD)
DS11	e	Safe Flood Capacity - discharge	10,100 cu.m/s
DS11	f	Safe Flood Capacity ("AEP"/"PMPDF"/"PMF")	PMF
DS11	g	Safe Flood Capacity (value of AEP/PMPDF/PMF)	PMF
DS11	h	Flood capacity (citation)	Googong Dam Risk Assessment - Final Report by SKM-30-03-2015

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS11	i	Flood events (#)	1
DS11	j	Worst Flood – date	8/04/2015
DS11	k	Worst Flood – peak inflow	86 Cu.m/s
DS11	l	Worst Flood – peak outflow	38.7 Cu.m/s
DS11	m	Worst Flood – peak headwater	RL 663.355 m AHD
Operations issues - Earthquake			
DS12	a	Safe earthquake - PGA	0.38g
DS12	b	Safe earthquake - AEP	Not available - See Note in Supplementary information
DS12	c	Earthquake capacity (citation)	Googong Dam Comprehensive surveillance Report Dec 2005.
DS12	d	Earthquake (#)	No event greater than (MMI) IV
DS12	e	Earthquake – date/“No Event”	No Event
DS12	f	Earthquake – intensity/“No Event”	No Event
DS12	g	Earthquake – shaking measured (state/“No Event”)	No Event
Operations issues - General			
DS13		Operating problems (Y/N?)	No
Maintenance performance			
DS14	a	Maintenance record (Y/N?)	No
DS14	b	Deferred Maintenance (Y/N?)	No
Inspection of dams			
DS15	a	Inspection regime (Y/N?)	Yes
DS15	b	Inspection frequency (Y/N?)	Yes
DS15	c	Inspection reports to suit dam (Y/N?)	Yes
DS15	d	Inspection reports minimum content (Y/N?)	Yes
DS15	e	Special/Emergency inspections (Y/N?)	No
DS15	f	Completion of inspections (Y/N?)	Yes
DS15	g	Inspection reports signed (Y/N?)	Yes
Surveillance reports			
DS16	a	Dam surveillance program submission (date)	29/10/2014
DS16	b	Latest Surveillance Report (citation)	Googong Dam Comprehensive Surveillance report - May 2014
DS16	c	Content of Surveillance Reports (Y/N?)	Yes
DS16	d	[Question for NSW Scheduled dams only]	See attachment 1 and 2
DS16	e	[Question for NSW Scheduled dams only]	Items 1 and 2 implemented. Item 3- See supplementary information.
Instrumentation			
DS17	a	Available instrumentation (list)	Leakage weirs, Ground water holes, Piezometers under the spillway, Seismometer, Accelerometer, Water Level sensors, Deformation targets, Rainfall gauge
DS17	b	Calibration of instrumentation (Y/N?)	Yes
Monitoring of dams			

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS18	a	Monitoring undertaken (describe)	Deformation survey, Leakage, Piezometer reading, Ground water hole measurement, Seismometer monitoring, Water level, Inflows, Outflows, Rainfall
DS18	b	Frequency of monitoring (Y/N?)	Yes
DS18	c	Monitoring of anchors (Y/N/"No Anchors"?)	No
DS18	d	Mechanical/electrical monitoring (Y/N?)	Yes
DS18	e	Monitoring records archived (Y/N?)	Yes
Surveillance evaluation			
DS19	a	Surveillance evaluation – personnel	Yes
DS19	b	Surveillance evaluation – frequency	Yes
DS19	c	Surveillance evaluation (Y/N?)	Yes
Safety review			
DS20	a	Latest safety review - date	March 2015
DS20	b	Peer reviewed comprehensive safety review (Y/N?)	Yes
DS20	c	Safety Review Report (citation)	Googong Dam Risk Assessment - Final Report by SKM-30-03-2015
DS20	d	Corresponding Separate Peer review Report (citation)	Googong Dam Peer review final report 14-04-15
DS20	e	Peer reviewed comprehensive safety review – availability	Not Planned
DS20	f	[Question for NSW Scheduled dams only]	DSC has reviewed the Comprehensive surveillance report 2014.
DS20	g	[Question for NSW Scheduled dams only]	Items 1 and 2 completed. Item 3 remains to be implemented in the next few years.
Dam safety emergency plans			
DS21	a	DSEP exists (Y/N?)	Yes
DS21	b	Date of latest DSEP update (citation)	Dam Safety Emergency Plan- Googong Dam Version1 - 2015, EN 2.3.6
DS21	c	Latest DSEP test (citation)	Exercise "Fish Belly" on Googong & Scrivener dams on 26-08-14.
DS21	d	Draft DSEP submission (date)	15/06/2015
DS21	e	Inundation mapping data submission (date)	15/06/2015
DS21	f	Inundation mapping data start (co-ordinates)	705420 E, 6077976N
DS21	g	Inundation mapping data end (co-ordinates)	644561E, 6125626N
DS21	h	Inundation mapping data submission sheets (#)	11
DS21	i	DSEP contact list submission (date)	15/06/2015
DS21	j	Dam emergency event report submission (Y/N?)	No
Security of dams			
DS22	a	Security plan (Y/N?)	Yes
DS22	b	Security plan test/review (date)	9-12-14
DS22	c	Security assessment (date)	Actew Corporation Security Management Plan-2014
Dam safety incidents			
DS23		Dam safety incidents (Y/N?)	No
Dam safety developments			
DS24	a	Developments affecting dam safety (Y/N?)	No

Dam specific responses

Note: Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

Number	Part	Question (short form)	Regulated Utility 2014/15 Response
DS24	b	Effect of any other dam (Y/N?)	No
Modification of dams			
DS25	a	Dam modifications (Y/N?)	No
DS25	b	Improvement due to modifications (Y/N/"No Modification"?)	No Modification
Key documents			
DS26	a	Design reports or safety reviews (Y/N?)	Yes
DS26	b	Safety reviews (citation)	Googong Dam Risk Assessment - Final Report by SKM-30-03-2015
DS26	c	Construction reports (Y/N?)	Yes
DS26	d	WAE drawings (Y/N?)	Yes
DS26	e	Safety status ("A", "B" or "C")	A



ACT
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Chief Minister, Treasury and
Economic Development

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Supplementary information

Note: Please reference each item with the relevant question.



Tip : Press Alt-Enter to start a new line in a cell.

Number	Part	Regulated Utility 2014/15 Response
DS 4	d	Another training course will be organised in 2015/16 to train more dam safety inspectors.
DS6	a	Aranda Service Reservoir O'Connor Service Reservoir Higgins Service Reservoir Spence Service Reservoir Oakey Hill Service Reservoir Mugga Service Reservoir Campbell Service Reservoir Kambah Service Reservoir
DS 12	b	This study would be included in the next safety review.
DS14	a	Trasrack inspection - Rescheduled November 2015. Anchors to be tested and heads to regrease planned for 2017/18.
DS 16	e	Item 3 remains to be planned and executed.
DS 20	a	Safety review was carried out in 1991 and construction of the reinforced earthwall and installation of anchors were carried out to withstand PMF flood. Googong Dam flood risk assessment was undertaken in March 2015 with a peer reviewed report which partially satisfies a comprehensive safety review. Comprehensive surveillance report was undertaken in November 2014.
DS 26	c	Construction report for 1991 upgrade Construction report for 2010 spillway upgrade Specification for Googong dam construction -1974

1 August 2014

Group Manager - Water
ACTEW Water
GPO Box 366
Canberra ACT 2601
Ms Amanda Lewry

Our ref: Googong

Your ref:

Dear Ms Lewry,

Re: Googong Dam – Surveillance Report (May 2014)

The NSW Dams Safety Committee (DSC) at its August 2014 meeting endorsed the above referenced Surveillance Report received on 22nd May 2014. The DSC endorses ACTEW Water's program for implementation of the Report's recommendations.

Please ensure that the following items are appropriately addressed:

1. The daily dam inspections currently undertaken, as described in Sub-section 6.1 of the Report, are considered inadequate for daily routine inspections of an Extreme Sunny Day Consequence Category (SDCC) dam. Please ensure that a more thorough daily inspection of the dam embankment and downstream toe are undertaken, including completion of an inspection form, in accordance with the *ANCOLD Guidelines on Dam Safety Management, 2003* for an Extreme SDCC dam. This is particularly necessary, as an issue regarding piping was raised in the recent risk assessment, and as there are no piezometers located in the dam and therefore the phreatic surface is unknown
2. Await a controlled copy of the updated Dam Safety Emergency Plan (DSEP, Report's Recommendation 58) by August 2014
3. Include the findings of the additional studies (see Report's Recommendations 44 to 49 and 52) in the next Type 1 Surveillance Report due by May 2019.

Your continuing cooperation is appreciated. If there are any queries in regard to the above please do not hesitate to contact the undersigned.

Yours sincerely,



for Steve Knight
Executive Engineer

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Googong Dam - Maintenance Items			
Recommendation		Priority	Progress
Outstanding Items from the 2005 Surveillance Report			
1	The anchor heads on the spillway crest should be inspected and regreased in 2005/2006.	P2	Implementation planned for 17/18
	This maintenance work is still outstanding and should be completed as soon as possible.		
Outstanding Items from the 2012 Annual Inspection Report			
2	Upgrade instrumentation at the dam.	P3	Under consideration
3	Install telemetry facilities for the instrumentation.	P3	Under consideration
4	Install network of cameras/alarm systems for security and dam safety around critical components of the dam to enable the operators to monitor the condition and security of the dam.	P3	TBA
5	Investigate the security status of the dam precinct in view of the new development around Googong suburb. Note this is currently in progress.	P3	Security assessment has been completed. Actew corporation security management plan -2014.
Recommendations from the 2014 Surveillance Report			
Inspections and Monitoring			
<u>Spillway</u>			
6	The spillway channel and cascade has not been inspected up close (via rope access) since the end of the construction upgrade works in December 2010. An inspection should be undertaken when the reservoir storage level permits safe access. At this time the known spalling concrete defect in one location can be inspected and a repair procedure developed.	P3	The inspection will be undertaken when safe to do so.
7	The post tensioning load on the anchors on the spillway crest should be checked and the heads regreased on a five-yearly basis. As the anchors have not been monitored since they were first installed, this task needs to be undertaken as soon as possible.	P2	Planned for 17/18
8	If the drains through the shotcrete slope protection on the access benches to the left of the spillway show signs of blockage, a thorough program of drainage inspection and maintenance should be undertaken.	P2	being monitored at annual inspections.
<u>Intake Tower</u>			

9	The load rating for the intake tower access bridge is not displayed. This should be clearly displayed on the access gate.	P2	Progressing with the load assessment
10	Minor cracking as a result of apparent Alkali Aggregate Reaction (AAR) was evident in the intake tower bridge piers, intake tower crest, and on the external and internal walls of the tower. There is no current cause for concern but the AAR cracking on the concrete structures should be reviewed and compared between subsequent inspections (i.e. five yearly basis) by taking detailed photographs. If the cracking worsens remedial actions may be required.	P3	Condition of the retaining wall is being monitored.
11	The condition of the internal surfaces of the intake tower valves should be determined by endoscopic camera.	P3	Options are being explored.
12	The actuator switch on Intake Valve No. 4 has seized which renders this valve inoperable for electric operation. This should be repaired.	P3	New actuator installed
13	The gearbox and actuator gaskets are weeping and should be monitored. If this deteriorates into a noticeable leak (dripping) remedial action must be taken.	P3	New actuator installed
14	The paint on the bypass valves in the intake tower has been damaged in a number of areas resulting in corrosion forming. This should be monitored and remedial action taken when corrosion spreads under adjacent paint or grows deeper (it is best touched up when first noticed).	P3	Maintenance item has been raised
15	Weeping gaskets on valve and actuator boxes in the intake tower should be monitored and repaired when weeping deteriorates into a leak (dripping).	P3	New actuator installed.
<u>Saddle Dam</u>			
16	The longitudinal cracks in the sealed road on the Saddle Dam crest, whilst not believed to be indicative of a serious problem in the embankment, should be monitored by taking photographs and comparing with those from future inspections (on a five yearly basis) to record any changes to the condition of the cracks.	P3	Cracks are being monitored at annual inspections.
<u>Instrumentation</u>			
17	Seepage readings from the weirs at the dam should be monitored daily to comply with the ANCOLD Guidelines on Dam Safety Management (2003).	P1	Daily measurements taken.
Maintenance			

<u>Main Dam</u>			
19	Some weed growth was noted on the upstream slope of the main embankment within the rip rap rockfill and towards the crest. This was noted on the downstream slope also. The riprap/rockfill on both slopes should be maintained clear of any vegetation growth. It is noted that weed removal was in progress during the dam inspection.	P1	Completed.
20	Whilst no excessive vegetation was noted to be growing along the upstream dam toe above the waterline, a minimum 5m vegetation free zone (bushes and trees) should be kept clear from the toe on the upstream slope.	P1	All trees within 5 meters of the dam edge removed.
21	Numerous trees and bushes were noted to be growing in close proximity to the embankment toe on the downstream abutment groins. All trees and bushes should be removed for a distance of at least 10m from the embankment toe on each downstream abutment.	P1	Completed
22	The weeds/long grass at the downstream toe should be routinely cut low so as not to hinder observations in this area. Again it is noted that this was in progress at the time of the inspection.	P1	Completed
<u>Intake Tower</u>			
23	The redundant electrical cables from under the intake tower bridge deck should be removed.	P3	Will be raised on maintenance program for 15-16.
24	The following tasks should be undertaken on the overhead crane at the intake tower:	P2	Will be planned to be undertaken with the next crane service. Maintenance services has been notified.
	· Apply grease to the cable drum and cable guide shafts;		
	· Clean the hook assembly and repaint;	P2	
	· The crane number, load rating and class number must be clearly displayed on the crane; and	P1	
	· It is recommended, but not a requirement, that all operations of the crane, e.g. load lifted, duration of lift, are noted in the logbook for future remaining service life calculation of the crane.	P3	
· If the crane is older than 7 years it must be assessed for continued safe use as required in AS 2550.1.	P1		
25	The intake tower screens and bulkheads require the following maintenance tasks:	P2	This activity is planned for the current financial year

	<ul style="list-style-type: none"> Remove the lifting frame and inspect for corrosion, damage and operation of all parts; 		Maintenance task has been raised.
	<ul style="list-style-type: none"> Apply markings to the lifting frame as required by AS 1418 (WLL, class number, identification number); 	P2	Maintenance task has been raised.
	<ul style="list-style-type: none"> Remove the bulkheads and inspect for corrosion and damaged seals; and 	P3	Maintenance task has been raised.
	<ul style="list-style-type: none"> Remove the screens and inspect for debris, corrosion and damage. 	P3	Maintenance task has been raised.
26	The following tasks should be undertaken on the handrails, ladders and platforms on the intake tower:		Maintenance task has been raised.
	<ul style="list-style-type: none"> Install a self-closing gate on the handrails around the tower access hatch; 	P1	Maintenance task has been raised.
	<ul style="list-style-type: none"> Install a chain or self-closing gate on the handrails providing access to the valve platforms; 	P2	Maintenance task has been raised.
	<ul style="list-style-type: none"> Place a protective sleeve over the sharp and ill-fitting corners of the handrails to prevent injury; 	P2	Maintenance task has been raised.
	<ul style="list-style-type: none"> Apply markings (WLL) to the platform beams that serve as lifting beams in accordance with AS1418; and 	P3	Maintenance task has been raised.
	<ul style="list-style-type: none"> Apply the load rating (WLL) to the lifting trolleys and have them certified. Alternatively remove the trolleys and certify them only when they are needed. 	P3	Maintenance task has been raised.
27	All valves should be operated on a 3 monthly basis through their full range of movement. This will allow the gears and bearings to be adequately lubricated and operate the electrical motors for an extended period thereby testing the insulation of the various components.	P2	Planning is underway to schedule the valve operation.
28	The hydraulic power unit for the low level outlet valve in the intake tower is in a fair condition but some of the valves and manifold blocks are corroded. These would benefit from the application of a rust preventative.	P2	Maintenance services notified
29	The following further maintenance recommendations are made for the Intake Tower:		
	<ul style="list-style-type: none"> Have all electrical actuators serviced. This may not be necessary if all actuators are to be upgraded in near future. 	P3	New actuators have been installed
	<ul style="list-style-type: none"> Install drip trays below hydraulic power units in tower and tunnel. 	P2	Maintenance task has been raised.

	· Install lamp test button in low level valve control panel.	P3	TBA
<u>Outlet Tunnel and Outlet Works</u>			
30	In several locations leakage through the outlet tunnel concrete is staining the pipework. This is a catalyst for corrosion and should be prevented by the installation of shields over the pipes.	P3	Planned to be actioned by Maintenance services.
31	The DN1000 low level guard valve should be operated on a quarterly basis, through the full range of movement, to test the operating system and the valve.	P2	Planning is underway to schedule the valve operation.
32	A small section of exposed reinforcement that is corroding was noted on the concrete at the downstream tunnel portal entrance. This should be repaired.	P2	Maintenance task has been raised
33	The chain on the air valve isolation valve actuator should be replaced and it should be ensured that the valve is open.	P2	Maintenance task has been raised
34	The isolation valves should be operated on a quarterly basis through their full range of movement.	P2	Planning is underway to schedule the valve operation.
35	The electrical actuator on the DN900 cone valve is unable to close the valve when opened further than 20mm open. The cone valve actuator should be serviced or replaced.	P1	already replaced with a new actuator.
36	The cone valve does not seal well and so the upstream butterfly valve is closed whenever the cone valve is not in use. Little of the cone valve could be observed; the valve should be inspected and tested in detail, including internal inspection with the valve fully open (upstream valve closed) to assess the condition of the sliding faces. Refurbishments should be made after the inspection, if necessary.	P2	Maintenance work scheduled. Planned to be completed in 15/16.
37	Both discharge valves should be operated on a quarterly basis through their full range of movement.	P2	Planning is underway to schedule the valve operation.
<u>Saddle Dam</u>			
38	Trees and bushes were noted to be growing in close proximity to the upstream toe of the Saddle Dam embankment, and also within the riprap. The riprap should be maintained free of vegetation, and all trees and bushes within a minimum of 5m of the upstream embankment toe should be removed.	P1	Completed

39	Some small saplings were noted to be growing on the upper downstream right embankment of the Saddle Dam towards the toe. Furthermore notable sized trees are present along both abutments, only a few metres from the embankment toe. Any saplings growing on the downstream slope should be removed. Furthermore, any trees or bushes growing within the 10m zone downstream of the dam toe should also be cleared.	P1	Completed
40	The top soil and grass cover protection to the downstream face of the Saddle Dam should be reinstated.	P2	Surface condition will be monitored
41	The vegetation growth at the toe of the Saddle Dam should be cut back or removed.	P2	Completed
42	The scoured out areas at the Saddle Dam toe should be reinstated.	P2	Coir logs placed to prevent further erosion
43	The surface runoff to the embankment toe could be limited in concentration by constructing a series of swales down each abutment groin, to direct runoff away from the toe at different levels. This would help prevent the scour at the embankment toe.	P3	Coir logs placed to prevent further erosion
Other			
44	The upstream side of the reinforced earth retaining wall on the dam crest is backfilled with impervious fill up to RL673.5m AHD. This level is approximately 1m below PMF level. The criticality of this deficiency should be reviewed, depending on the outcome of this review upgrade works may be required.	P3	Will be included in the future safety review
45	None of the extractable anchor straps on the reinforced earth retaining wall on the dam crest have been removed to evaluate the degree of deterioration of the straps to date. Reinforced Earth has advised that two straps should be extracted for examination at 25, 40, 60, 80 and 100 years respectively. Given the wall was constructed in 1991; the first two straps should therefore be removed in 2016.	P3	Will be included in the 17/18 maintenance plan
46	There is no blanket drain under the random fill placed as part of the Saddle Dam raising on the downstream shoulder of the embankment. The chimney filter in the Saddle Dam also extends to full supply level only. These deficiencies in the raised Saddle Dam design need to be reviewed, with consideration given to upgrading the embankment.	P3	Will be included in the future safety review

47	The method in which the pseudo static analysis of the dam was undertaken in the 1988 Dam Safety Review does not meet the criteria of current analysis methods. Furthermore no seismic hazard assessment has been undertaken specifically for the Googong Dam site to confirm the earthquake loading to be used in the pseudo static analysis. It is recommended that a) the seismic hazard assessment be undertaken for Googong Dam, and b) the results of this be used to complete an earthquake stability analysis of the dam.	P3	Will be included in the future safety review
48	The stability analysis for the Saddle Dam, undertaken as part of the 1988 Dam Safety Review, was assessed for a raised embankment with a reinforced earth retaining wall on the crest. This does not reflect the current arrangement of the dam, and therefore the Saddle Dam stability should be reassessed.	P3	Will be included in the future safety review
49	There is some confusion with regards to the stability analysis results for the reinforced earth retaining wall, with two sets of stability data presented in the Draft Googong Dam Remedial Works Design Report. One set of data has some factors of safety of less than 1. Given the only review of the crest wall was made 23 years ago when it was designed, it is recommended that the stability of the structure be reviewed again.	P3	Will be included in the future safety review
50	<p>The dam intake tower should be able to withstand ground accelerations corresponding to the 1 in 475 year seismic event.</p> <p>The analysis undertaken to date suggests the intake tower would collapse under seismic loads corresponding to a 1 in 2,500 event; however the return period of this seismic event was based on seismicity data not specific to the Googong Dam site. It is recommended that the peak ground acceleration for the 1 in 475 year seismic event for the dam site be confirmed, after which the ability of the tower to withstand this loading can be assessed. Further analysis and strengthening works may be required, depending on the outcomes of this.</p>	P3	<p>Will be included in the future safety review</p> <p>Will be included in the future safety review</p>
51	The intake tower foundation rock anchors are required for both earthquake stability and buoyancy control, and the durability of these anchors is critical to their effective life span. It is not possible to inspect the anchors without intrusive investigation works. It is recommended that following the assessment of the intake tower seismic stability, and any analysis that results from this (where required), that the durability of the intake tower anchors be	P3	Will be included in the future safety review

	reviewed.		
52	<p>SKM, authors of the dam risk study, highlighted that some of the assessments in the study were based on incomplete information or on assumptions, and that ACTEW Water should consider undertaking further studies to provide more robust information. This would allow an update of the risk study at a future date. Of the suggested studies highlighted, the following were not covered elsewhere in this report:</p> <p>1. <i>'Improved estimates of the probable loss of life and dambreak inundation extents, depths and velocities. The modelling techniques used in the current project are based on application of one-dimensional modelling and the Graham (1999) procedure. Future work could include use of two-dimensional modelling and procedures such as HEC-FIA to estimate loss of life. This would help to both increase the confidence in the loss of life estimates and also provide more detailed data to emergency services for planning and response to a dambreak event.'</i></p> <p>2. <i>'Much of the original material grading data has been lost and so a robust assessment of filter compatibility in the main embankment and saddle dam was difficult. ACTEW Water could consider undertaking drilling, sampling and materials testing in both the main embankment and saddle dam to provide more comprehensive grading data to support future assessments.'</i></p> <p>We also recommend that ACTEW consider undertaking these studies/investigations to improve the reliability of the risk study results.</p>	P3	will be considered in the next review
53	Due to the amended valve layout to include the mini hydro station, a detailed review of the outlet works should be undertaken to determine the revised capacity of the system to confirm it meets operation requirements, and to verify that velocities through the valves are within their design range.	P3	TBA
54	The cause of the cracking of the outlet works right hand reinforced concrete retaining wall should be investigated, and a suitable patching procedure designed before undertaking any repair works.	P3	TBA

55	Some components of the Surveillance Procedures document were not up to date, and did not reflect current practices at the dam. This document should be updated as soon as possible.	P1	Revised document completed. Currently awaiting management approval.
56	There are several sections in the O&M Manual that describe the same surveillance and maintenance strategies/requirements, and some are not specific to the equipment at the dam. To make the document easier to read it is recommended that the surveillance and maintenance requirements are stated in only one section and that they should be specific to the equipment at the dam.	P3	Review of O&M Manuals currently in progress
57	A gap analysis is required for the O&M Manual to review what information is missing in terms of operating procedures and maintenance activities for all components of the dam. The missing information should then be included in the document.	P3	Currently undertaken
58	The flood hydrology and consequences of failure has recently been re-evaluated for Googong Dam. This information should be updated in the DSEP, including the flood maps.	P1	Done
59	A desktop test of the DSEP was undertaken in 2013 by an external facilitator. Any recommendations from this testing should be incorporated into the DSEP. The DSEP should continue to be tested at five yearly intervals.	P1	Actioned
60	Previous survey of the plunge pool did not match up well with the survey datum used on site during construction of the spillway and plunge pool upgrade. As such the results of the survey were erroneous (showing erosion where no erosion has occurred).	P3	This would be undertaken with next major survey planned for 2019.
	It is recommended that the survey data be reviewed by the surveyor to see if this can be corrected to match up better with the site datum. Otherwise at the time of the next plunge pool survey, it should be ensured the survey datum matches that used on site.		