NSW Resources Regulator

NSW mining dredges

Planned inspection program

NSW GOVERNMENT

NSW RESOURCES REGULATOR

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Executive summary

The NSW Resources Regulator conducted a review of all dredges operating at NSW mines following several incidents involving dredges.

These incidents included collisions, sinkings, electric shocks, mechanical failures and weather problems.

The Resources Regulator's Small Mines team carries out planned inspections of mines across NSW. Typically, these inspections target principal mining hazards. As a consequence of these incidents and analysis of available incident data, dredges were included in the inspection program.

This report presents the findings of planned inspections on dredges, providing an insight and a broader understanding of dredges operating across the NSW mining industry and prompt a review of the effectiveness of preventative safety measures.

The report also provides an initiative for the industry to improve the safety focus on dredges.

In June 2017, a dredge sank at Dunmore Sand and Soil. As a consequence of this and other incidents associated with dredge operations a strategy was developed by Resources Regulator inspectors to verify that all dredges in NSW mines were in a fit-for-purpose condition.

Consequently, a planned inspection process was implemented. To improve the quality of the existing planned inspection assessment documents, a workshop was held in December 2017, involving Resources Regulator inspectors and a representative of the NSW Roads and Maritime Services.

The assessment document was aligned with existing NSW legislation and the expectations of the Australian Maritime Safety Authority.

Dredges are classified as domestic commercial vessels under the *Marine Safety (Domestic commercial vessel) National Law Act 2012* and must meet the requirements of this legislation. Additionally, NSW mine operators of a dredge must comply with the *Work Health and Safety Act 2011,* Work Health and Safety Regulation 2017, *Work Health and Safety (Mines and Petroleum Sites) Act 2013* and the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014.

Dredges operating in NSW mine sites have a requirement to report to two regulators - the Australian Maritime Safety Authority and the NSW Resources Regulator.

The main types of dredges include:

- → suction (vacuum) dredges
- → bucket dredges
- → clamshell diggers
- → backhoe/dipper type dredges
- → water injection dredges
- → pneumatic dredges
- → bed levellers
- → snagboats

Each type of dredge uses specific machinery to perform its task. A suction dredge uses a long vacuum tube to suck sediment out of the water and into delivery lines. Other types of dredges use cranes with clamshell grabbers to scoop rocks, sand, and other sedimentary material from waterways.

Background

The NSW Resources Regulator uses planned inspections (PIs) as a proactive assessment tool to assess how effectively an operation controls critical risk. As with targeted assessments (TAs), planned inspection programs examine how effectively an operation controls risks associated with its principal hazard management plans (PHMPs) and principal control plans (PCPs).

Planned inspections look for evidence that:

- → systems and procedures identified in a specific PHMP/PCP to manage risk are functional
- → implementation of procedures described in the PHMP/PCP is ongoing
- → it has been verified the risks are controlled
- → the controls are being monitored to ensure they remain effective
- → the workforce is competent and confident about the implementation of the identified risk controls relevant to their work area, equipment and level of responsibility.

The process

The process for undertaking a planned inspection generally involves the following stages:

1. a request for documentation and/or the site to prepopulate the inspection template provided
2. interviews, observations and inspections of relevant plant operations on site as per the inspection template. Any significant issue identified on site, regardless of its nature, will also be reviewed by the inspectors in attendance.
3. review of gathered information
4. on site debrief
5. discussion and feedback to the mine management team on the findings and actions that need to be taken by the operators in response.

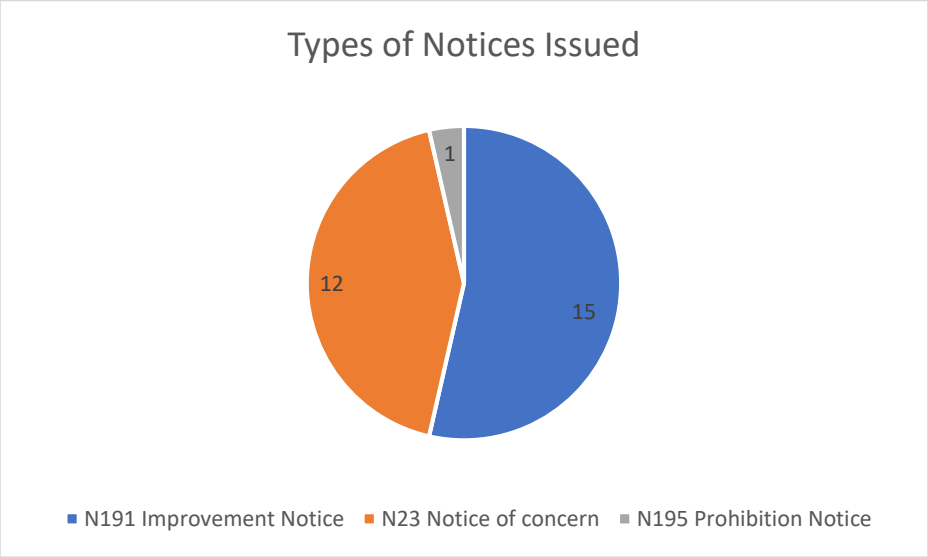
The debrief provides immediate feedback on the outcomes including:

- → the team's findings and outcomes
- → any immediate enforcement action that will be taken
- → advice of next steps – the process and an indication of the dates for the response of any notices issued.

Notices

A total of 29 notices were issued.

Following is a summary of notices issued as a result of the planned inspections.



Definitions

AMSA	Australian Maritime Safety Authority established by the *Australian Maritime Safety Authority Act 1990.*
Certificate of survey	Generally, vessels are required to have a certificate of survey to operate a commercial vessel in Australia. Every domestic commercial vessel is required to have a certificate of survey unless it is exempt.
Certificate of operation	A certificate of operation sets out the conditions under which a domestic commercial vessel—or fleet of vessels—must operate, including: → the vessels used in the operation → how and where the vessels can operate → other conditions AMSA considers necessary due to the nature of either a vessel or an operation.
Coaming	A raised border around the cockpit or hatch that assists in sealing openings in the hull.
Dredge	A vessel fitted with specialised machinery to extract materials from waterways.
Enclosed waters	A pond on private land.
Existing vessel	(1) For this order, a domestic commercial vessel is an existing vessel if:

a) a person was entitled to use the vessel in connection with a commercial, governmental or research activity at any time in the two years ending on 30 June 2013; and

b) the vessel was not a foreign vessel at any time in the two years ending on 30 June 2013.

(2) However, a vessel is not an existing vessel if there has been a break in its use in connection with a commercial, governmental or research activity, of a period of more than two years after 30 June 2013.

(3) Also, a vessel is not an existing vessel if the national regulator considers that:

a) it has been altered or modified to the extent that it must be reassessed against the standards for construction, subdivision or stability that apply to the vessel; or

b) the nature of its operations or its area of operation has changed so that there is an increased level of risk.

Grandfathered	An activity, person, group, etc. that is grandfathered is not covered by a new law because of a grandfather clause.
In survey	A vessel that has obtained a certificate of survey to operate as a commercial vessel in Australia.
National law	Marine Safety (Domestic Commercial Vessel) National Law set out in Schedule 1 to the National Law Act.
National Law Act	*Marine Safety (Domestic Commercial Vessel) National Law Act 2012.*
New vessel	Under marine order 503 a vessel is 'new' if it is not 'existing' or 'transitional'. New vessels must meet the standards for construction, subdivision, stability, fire safety, machinery, and associated systems and equipment set out in the *National Standard for commercial vessels* and select sections of the *Uniform shipping laws code.*
NSCV	*National Standard for commercial vessels* detailed in the National Law.
RMS	Roads and Maritime Services NSW
Transitional vessel	From 1 January 2018, domestic commercial vessel owners can make certain changes to their 'existing vessel' without having to meet all the standards that apply to a 'new vessel'. These vessels will become a 'transitional vessel'.
Vessel	Under the National Law, each of the following is a vessel: → boat → canoe → dinghy → dragon boat → kayak → pontoon → tinnie

Overview of mining dredges in NSW

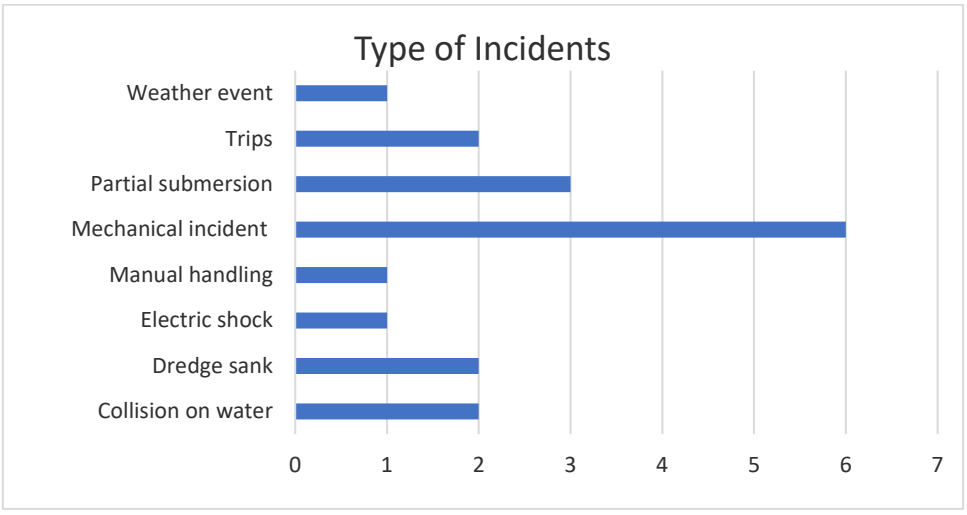
There are 25 known dredges operating at 27 mine sites in NSW.

Figure 1: Dallas Sand Pump, Murrumbidgee River Whitton NSW. Photography by Resources Regulator inspectors.

The dredges inspected varied in size from 6 metres to 42 metres long. The complexity of the dredges varied with some being manned and others unmanned, some were GPS-controlled. Thirteen of the dredges were self-propelled with the remainder being moved via steel wire cables and hydraulic winches.

The area of operation also varied, with 16 dredges operated in enclosed ponds and the remainder in navigable waterways i.e. Tweed River, Murrumbidgee River, Murray River.

In the past five years there have been 17 safety-related incidents associated with dredging reported to the regulator. A summary of the dredge incident reports is attached in Appendix 1.



Planned inspection program

In December 2017, a workshop was held with representatives of NSW Roads and Maritime Services to assist in the review of relevant legislation and to update the regulator's inspection documents.

The *Marine Safety (Domestic commercial vessel) National Law Act 2012* applies to domestic commercial vessels. Domestic commercial vessels are defined in section 7 of Schedule 1 to the National Law Act and it is likely that a dredge operating in a mine site will meet the definition.

At the workshop, it was identified that the following would be considered during inspections:

Hazard risk assessment and management plan requirements. (Work Health & Safety (Mines & Petroleum Sites) Regulation 2014)

Unique vessel identifier requirements

Certificate of operation requirements

- → Mandatory for all parent vessel (main dredge).
- → Formally known as a commercial registration.
- → Covers all waters under National Law as of 1 July 2013.
- → New vessel since 1 July 2013: contact AMSA to confirm the standards that apply to the operation on telephone: (02) 6279 5000.

Survey/slipping requirements

- → Most dredges will come under the "grandfather" clause where they do not have the requirement to be in survey.
- → Survey/slipping requirement (from 1 July 2013) Marine Safety (Domestic Commercial Vessel) National Law Act 2012, (Regulations 2013)

a) Does vessel require survey?

- yes if >7.5 metres
- yes if >500kw pump

b) Is vessel slipped regularly?

- Requires one in five years

c) Is structural NDT work performed?

Structure: design

- → Has a design risk assessment been conducted?
- → Have buoyancy calculations and tests been made by a qualified naval architect?
- → Has the stability of the dredge been considered if compartments fail simultaneously?
- → Is there a stability book (must have if in survey)?

Structure: stability

→ Evidence that stability capabilities during adverse conditions have been considered.

Structure: hull integrity

→ Exterior free of corrosion, painted and no obvious structural damage.

→ Interior hull free of corrosion, coated with a rust inhibiter and inspected regularly (not greater than every two years if conditions are favourable).

→ Evidence of electrolysis can include pitting and paint blowing off.

Structure: deck integrity

→ If sealed without regular access then no coaming is required.

→ Coamings should be installed ideally 100 mm.

→ No identifiable requirement, however has confined space implications.

Incident reporting procedures

→ Incidents should be reported to the AMSA within 72 hours (refer Appendix 2)

→ Incidents should be reported to the Resources Regulator (telephone 1300 8014 609)

Work environment: radioactive sources

→ Density meter

- Yes/No
- If present, confirm licence and licence requirements (competent person).

→ For further information:

- www.epa.nsw.gov.au/your-environment/radiation/radiation-user-licence/user-licence-introduction/user-licence-criteria

Figure 2: APM Sands Riverblock, Murrumbidgee River, Leeton NSW. Photography by Resources Regulator inspectors

Changes to the National Standard for the Administration of Marine Safety

The AMSA had traditionally delegated functions of the national regulator to each state maritime safety agency, which was responsible for enacting the federal legislation including conducting survey assessment of vessels and issuing vessel licences.

From 1 July 2018, surveys required under Marine Order 503, Marine Order 507, Exemption 40 will be authorised by AMSA (by independent accredited marine surveyors) and must be undertaken in accordance with Part 2 of the *Marine surveyor manual*. www.amsa.gov.au/vessels-operators/domestic-commercial-vessels/about-marine-surveyor-manual

Marine order 503—certificates of survey—national law.

This marine order provides information about:

- → survey, design, construction and equipment standards
- → who can survey a domestic commercial vessel
- → applying for a certificate of survey
- → criteria that must be met for AMSA to issue a certificate of survey
- → conditions on a certificate of survey
- → variation, suspension or cancellation of a certificate of survey
- → applying for an equivalent means of compliance.

Further information can be found at: www.amsa.gov.au/vessels-operators/regulations-and-standards-vessels/marine-order-503-certificates-survey-national

Changes to survey schedules

The most significant change is that the National Standard for the Administration of Marine Safety Section 4 (Surveys of vessels) requirement to test, verify, examine or trial items in specific years has been replaced by a general requirement that surveyors test, verify, examine or trial items to the extent necessary to be satisfied that the vessel complies with the applicable legislation and standards.

Other changes incorporated as a result of industry feedback include:

- → Clarification of the timing and scope of the lightship verification periodic survey requirements. These changes clarify that class 2, 3 and 4 vessels, and class 1 vessels less than 12 metres, may make a declaration of any changes made to the vessel, instead of full lightship verification. This better reflects the lightship verification arrangements these vessels have been subject to.
- → A requirement to inspect permanent ballast as part of a survey.

Figure 3: Allsands Mine (enclosed pond) Kurnell NSW. Photography by Resources Regulator inspectors.

Findings of the inspection program

Figure 4: Hanson Tweed Sand Quarry (enclosed pond) Cudgen NSW. Photography by Resources Regulator inspectors.

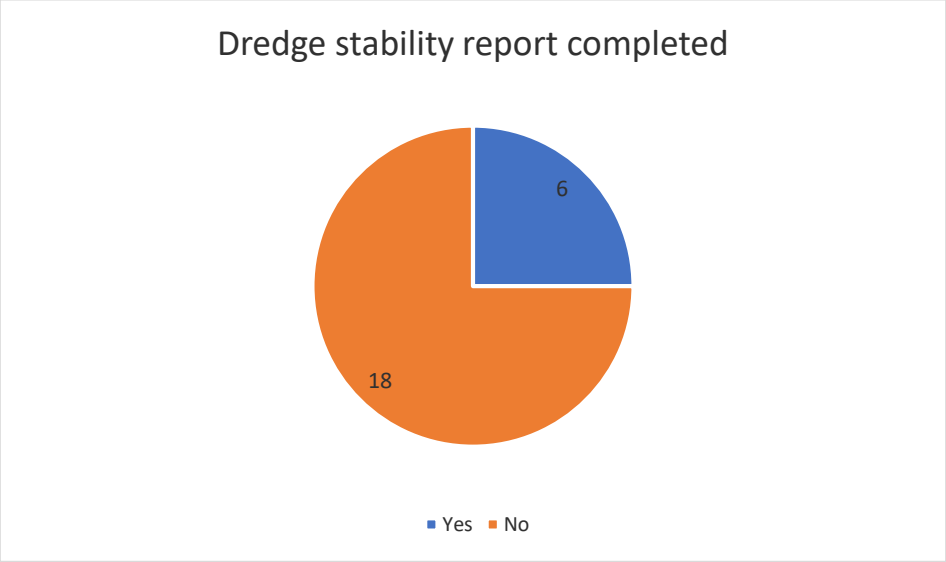
A number of dredges failed stability testing. One dredge had a N195 prohibition notice issued preventing its use until the recommendations in the stability report were completed.

Identified non-conformances

The following non-conformances were identified during inspections:

1. No design risk assessment/documentation available or limited information with respect to the dredge's overall specifications.
2. Risk assessment for the operation of the dredge not completed or very minimal.
3. Preventative maintenance on the dredge was not documented in the mechanical engineering control plan and/or electrical engineering control plan.
4. Vessel crewing competencies were not assessed or documented.
5. Mine operator could not confirm if all the dredge operators could swim.
6. There was no formal inspection process or record keeping of inspections to determine if there was any water ingress in both the hull and the ongoing hull integrity.
7. There were no high visibility markings on the dredge or the delivery line to ensure adequate illumination.
8. There was no alarm device or inspection protocol to monitor freeboard.
9. There was no pendulum or device to indicate list of the vessel.
10. There was no bilge pump, bilge alarm or inspection protocols to ensure there was no internal water ingress in the hull.
11. The dredge was not included in the site's emergency response plan.
    a. No emergency procedures for flood events.
    b. Emergency response plan was not tested. For example, the evacuation of a 'man down' (unconscious worker) on the vessel was not tested.
12. Battery terminals were not covered.
13. Emergency e-stops did not work or were not fitted. No program of testing.
14. Confined spaces were not identified.
15. Most decks had slip, trip hazards with few controls in place.
16. Winch frames did not have safe working limits on the structure.
17. Safe work procedures were not developed for:
    a. moving or relocating the dredge
    b. maintenance of the delivery line
    c. working alone or man overboard procedures
    d. refuelling.
18. Issues were identified with the handrails. There was no kick/toe board.
19. No calculations are available from a qualified naval architect for the dredge.
20. The external fuel shut off valve on the dredge engine compartment was corroded and not functional.

21. Corrosion on the dredge was evident and a number of mechanical failures occurred due to corrosion (engine compartment hinges, fuel shut off, crane hoist).
22. The mine operator had not established the operating noise exposure level for the dredge operator in the open cabin.
23. Inadequate fire suppression systems. Dredge not included in the principal hazard risk assessment for fire or explosion.



Best practise

Best practice initiatives were identified on several of the dredges inspected. These included:

- → extensive documentation that was logically set out, easy to understand and developed after a rigorous, risk-based approach that included effective consultation with workers.
- → well-engineered mooring facilities that allowed ease of embarking and disembarking.
- → man down response systems including:
  - o back-to-base notification devices
  - o stretcher mounted on tender
  - o auto inflation personal flotation device
  - o thorough/detailed emergency procedures and evacuation plans.
- → a high standard of environmental and safety controls used to deal with dangerous goods and combustible liquids transported and consumed on the dredge.
- → hydraulic hoses wrapped to contain any leaks.
- → stainless steel hydraulic pipework.

- → spill kits including containment booms.
- → stringent refuelling procedures.
- → structured, preventative maintenance programs that used external expertise including structural, electrical and marine engineers to ensure seaworthiness.
- → engagement of naval architect to provide stability assessments.
- → AMSA-issued certificates of operation that included individual identifiers on dredge and support vessels.
- → dredge location, excavation and final profiling through GPS control.

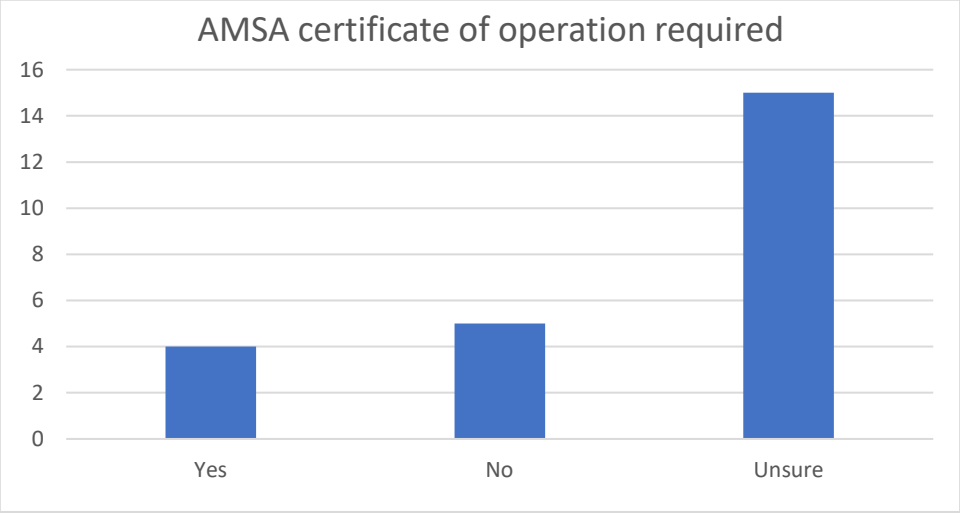
Figure 5: Action Sands, Tweed River, Chinderah NSW. Photography by Resources Regulator inspectors.

Outcomes

The outcomes from the planned inspection program are as follows:

1. With the national law being fully enacted from 1 July 2018, the Planned Inspection Dredge template is required to be revised to ensure it meets the requirements of National Standard Commercial Vessels. The National Standard for Commercial Vessels (NSCV) contain the standards for vessel survey, construction, equipment, design, operation and crew competencies for domestic commercial vessels.
   - → Part B: General requirements
   - → Part C: Design and construction
   - → Part D: Crew competencies
   - → Part E: Operations
   - → Part F: Special vessels
   - → Part G: Non-survey vessels

2. Conduct follow-up inspection on identified dredges to ensure they have complied with the regulator's notices and have clarified the operational requirements with AMSA under the National Maritime Law. Refer Appendix 4 – Non-survey vessel approval or exemption



3. In consultation with AMSA develop industry guidance material for mining dredges.

Where to now?

Planned inspections provide an account of the issues observed at particular sites at a particular time. Some of the findings resulted in notices being issued, including

- → notices of concern, under section 23 of the WHS (M&PS) Act,
- → improvement notices, under section 191 of the WHS Act
- → prohibition notices under section 195 of the WHS Act

The matters addressed by the notices reflect the findings of the Resources Regulator inspectors. By way of example these findings included:

Notice	In relation to
Prohibition notices, s195	→ Failed stability assessment on dredge
Improvement notices, s191	→ A mine had not identified and conducted a principal hazard risk assessment and had not developed the relevant principal hazard management plan. → A mine operator had not developed relevant principal control plans. → Toilets and washing facilities were not available to workers at the mine. → The dredge did not have adequate access or egress points for access from the tender (flat bottom boat). → Walkways on a dredge were not constructed to recognised industry standards and did not prevent workers falling over or under hand rails into a moving waterway. → A mine operator was not able to provide a copy of the vessel's stability report or design documentation and had limited information with respect to the dredges overall specifications. → The mine operator had not considered 'fire and explosion' detection. → A mine operator had no procedure for fighting a fire on the dredge. → A set of work activity safe work method statements (SWMS) and procedures were not located on the dredge. → A 'working alone' procedure did not consider a 'man down' scenario in sufficient detail to ensure a timely response to an incident.

- The emergency response plan had not been tested with a drill.
- The emergency response plan did not detail where emergency services would assemble for a dredge emergency.
- The mine operator did not have a documented preventative maintenance program for maintenance activities on the dredge.
- There was no formal inspection process or record keeping of inspections to determine if there is any water ingress in the hull and ongoing hull integrity.
- The navigation lights on the mast had a red, green, red format which should be red, white, red.
- Wire ropes were not fit for purpose e.g. unlubricated and with numerous broken strands.
- The engine compartment contained an amount of fluid (water/oil mix) that was controlled with the use of absorbent pads. The pads appeared to be submerged and had reached their used by date.
- The external fuel shut off valve on the dredge engine compartment was corroded and not functional.
- Corrosion on the dredge was evident and several mechanical failures have occurred due to corrosion (engine compartment hinges, fuel shut off etc).
- The front anodes had corroded past their discard criteria.
- The ‘spud’ assembly was missing a belly wire in the handrail.
- A screen, had unguarded nip points and lacked emergency stop buttons. People working adjacent to hydraulic equipment were not protected from fluid injection from the failure of hydraulic hoses.
- A dredge had one e-stop located near the engine and it was not working on the day of inspection. It was noted that there was no e-stop in the control room.
- Modifications had been made to a dredge since its commissioning. Stability testing had not been completed to ensure it stability capabilities were fit for purpose. The dredge was listing to one corner.
- Discharge points on some bilge pumps could not be confirmed as to the fitting of non-return valves. No bilge alarm was fitted and a formalised inspection protocol was not in place.
- No earth leakage had been fitted to electrical installations in a control room. Test and tag on the battery charger was out of date. Electrical isolation points had not been identified and

labelled. An untested domestic power board was in use in the control room.

- Exposed battery terminals posed a risk of fire.
- An overhead gantry had not been certified or labelled with a SWL.
- A procedure for the restoration of power after a protection trip had not been developed.
- Electrical isolation points had not been labelled.
- A documented preventative maintenance system had not been developed for the dredge and associated craft.
- Not all confined spaces were identified with clear and legible signs on some dredges.
- Safety equipment – oars were missing from a tender boat.
- Access to an engine bay was via an unsecured step ladder.
- There was a risk of workers slipping from the dredge access walkway pontoons due to a lack of suitable fall from height controls.
- Some pressure vessels had not been appropriately inspected.
- Spill kits were not available to manage hydrocarbon spills.
- Some emergency procedures did not reflect the current management structure and contact details.
- Insufficient and poorly located fire extinguishers.
- There was no qualified electrical tradesperson nominated in the management structure for a site.
- The sand washing plant had a several nip points on the trommel and bucket wheel exposing workers to an entanglement hazard.
- A sand washing plant access way had a gap between it and the main plant exposing persons to a fall from height hazard.
- A tail drum on a sand washing plant discharge conveyor was not guarded satisfactorily to prevent a person from being exposed to an entanglement hazard.
- It was observed that a dredge had about 100 mm freeboard at the front the dredge and about 300 mm freeboard at rear. Buoyancy of the dredge in adverse condition had not been confirmed by the completion of a stability report.
- Calculations were not available from a qualified naval architect for a dredge's stability and seaworthiness.

- The stability of a dredge was not analysed for a scenario where compartments fail simultaneously.
- There was no alarm device or inspection protocol in place to monitor freeboard on a dredge.
- A pendulum or similar device to indicate list of the vessel was not available.
- Procedures had not been developed for a flooding emergency event.
- Hydraulic load locks were not installed on the boom of a lifting jib to prevent catastrophic lowering as a consequence of a hose burst.
- Some dredge operators had not been trained in first aid.
- Some dredges had no procedures in place for draining compartments containing spilt oil and fuel.
- Some dredges had inadequate safety signage in the work environment.
- There were no high visibility markings on some dredges or the attached delivery line.

Notices of concern, s23	→ Bunding issues in and around the sand/silt trap below the sand stockpile area. → A copy of the risk assessment was not available for the design and implementation of the digger on the barge. → SWMS documents did not include any correlation with respect to how the hierarchy of controls had been considered in the selection of controls. → There was no readily available map of the ships electrical circuits. → The risk assessment for the identification and control of fire and explosion hazards needed to be reviewed to ensure that it systematically and comprehensively considered all potential fire sources and reflect the contents of the sites controls documents. → There is no consideration in an emergency procedure of how emergency services would access the river leases and where these access points would be along the river frontage. → Given the location of the dredge during operating activities the emergency equipment located on the ship may not be able to effectively handle a heart attack situation if it was to occur.

- A mine operator had not made adequate provision in its risk assessment for the hazard of fire and dredge buoyancy or sinking.
- A mine operator could not provide adequate documentation regarding a formalised preventative maintenance program for critical safety items for the dredge.
- A mine operator had not made adequate provision for the testing of its emergency plan regarding the evacuation of an unconscious worker from the dredge.
- Verification of competence records for the dredge operator were not available.
- Flexible extension lead left lying on the ground.
- Out of the water slipping had not been considered in a dredges preventative maintenance program and was completed in an ad hoc basis.
- The electrical cabinet containing an inverter did not have signage to alert persons it contained a 240 volt installation. The cabinet was also unlocked.
- A dredge did not have a Certificate of Operation or unique vessel identifier (UVI) issued by AMSA (Australian Maritime Safety Authority). Changes to legislation in July 2013 now require all vessels be subject to this requirement.
- A risk assessment had not considered the hazard cumulatively with other hazards on site.
- A dredge was not included in the Principal Hazard Management Plan & Risk Assessment for Fire & Explosion.
- An indicative noise reading taken in the dredge operator's cabin gave readings of 86-88 dBA.
- A mine operator had not confirmed the vessel crewing (competency) under the Certificate of Operation.
- A fuel storage tank did not have a suitable entry on top of the access ladder.
- Gauges and controls in a control room required labelling.
- A dredge, barge and workboats are not included in the mechanical engineering control plan. Inspection and maintenance plans had not been developed to ensure controls were being maintained.
- No procedures were in place for the replacing ropes.
- Emergency procedures/contact list did not have mobile phone numbers listed.

- → Management should know who can swim, as this would determine who should work on the dredge or tender boats when tasks are assigned.
- → Working alone was not considered in some risk registers.
- → Channel markers were not always observed in the navigable river.
- → The competency and names of persons undertaking risk assessments had not been recorded on some documents.
- → The hierarchy of control used for each control was not noted on risk assessments.
- → Some decks had numerous trip hazards.

All mine operators involved in the planned inspections have indicated that they would respond to the notices and other issues identified through the inspections. Where significant issues were identified, these will be followed up with the individual mines.

The regulator expects that all mines will review their practices and procedures in consideration of the findings in this report.

Issued by

Garvin Burns
Chief Inspector
NSW Resources Regulator
NSW Department of Planning and Environment

Further information

For more information on planned inspection programs, the findings outlined in this report, or other mine safety information, please contact the Resources Regulator's Mine Safety branch. You can find the relevant contact details below.

Type	Contact details
Email	mine.safety@planning.nsw.gov.au
Phone	1300 814 609
Incident reporting	To report an incident or injury call **1300 814 609**
Website	resourcesregulator.nsw.gov.au
Address	Resources Regulator, Mine Safety 516 High Street Maitland NSW 2320

Appendix 1 – Dredge incident report summary

Date	Details	Incident type
15/09/2018	The port side pontoon of the floating concentrator plant suffered some sort of failure and sank. The pontoon settled on the bottom, and the concentrator plant was listing at about 35 degrees. There were two workers on the floating plant at the time and they evacuated the plant safely. They did comment that it happened quite suddenly and started to list after about 20 seconds. The area at the dredge pond was barricaded and a traffic plan implemented to control traffic.	Dredge sank
11/07/2018	After reaching a barge in dingy, the dingy became unsteady, a worker went to regain balance by grabbing the new handrail, overbalanced, then fell and landed on his shoulder.	Trip
21/12/2017	While welding a cleat to the port side of the dredge about 100 mm above the water the wind created waves that splashed up onto the work area. This resulted in the person welding suffering a mild electric shock. He was taken to hospital for treatment.	Electric shock
17/10/2017	A maintenance worker was walking on a barge and stepped half on a man hole cover and half on the deck of the barge. In the process he rolled an ankle. He continued to complete the maintenance work. The maintenance supervisor noticed the worker's expression and asked what happened. The worker explained his injury and was directed to return to shore and report the injury.	Trip
2/08/2017	A worker said he had a sore back when he began his shift. He said he might have pulled a muscle working on a pipe. The worker was taken to a medical centre where he was diagnosed with a muscle spasm. The doctor issued a medical certificate for the worker to limit his work duties temporarily	Manual handling
8/06/2017	A rear winch on a dredge dislodged and fell into a pond.	Mechanical incident
26/05/2017	Two boats collided at low speed on the dredge pond while one was leaving the jetty and the other approaching the jetty. The boats glanced off each other and nobody was injured and there was no damage to the boats. The incoming boat did not hear the radio communications from the outgoing boat.	Collision
15/05/2017	A dredge sank on a dam on Sunday night, 14 May. Nobody was on board or present at the time. The circumstances are unknown.	Dredge sank

23/06/2016	While on a sand dredge an operator was working on the rear winch as the wire rope had come off the drum. He was repositioning the wire rope when a gust of wind blew the dredge sideways and put tension on the wire pinching his left thumb. The operator was wearing gloves. The wound required stitches.	Mechanical incident
10/03/2016	While returning in a dredge tender dingy a dredge operator accidentally struck a river channel marker buoy and hit his back against the stern of the dingy. The operator continued his shift, but later saw a doctor for X-rays. Some bruising and pain was identified.	Collision on water
25/02/2016	Two dredge operators had opened the door to the rock box on the inlet to the dredge slurry pump to check for rocks blocking the pump. The door could not be closed by manual handling. One operator left to get the overhead crane control. The second operator waited by the rock box. The door suddenly fell from the rock box and hit the operator's hand.	Mechanical incident
16/12/2015	When a tornado hit the mine site with winds up to 215 km/hour, the dredge roof was ripped off and thrown into the water. Nobody was injured.	Weather event
30/12/2014	While the boom of a dredge was lifted up, it touched the front pontoon of the dredge causing a crack that allowed water to infiltrate and disbalance the dredge.	Partial submersion
17/11/2014	On Friday night the mine stopped dredging operations. During the weekend the dredge front pontoons took water causing the front part of the dredge to submerse.	Partial submersion
14/08/2014	Winch rope unspooled off dredge ladder winch and fell to the bottom of a pond.	Mechanical incident
10/07/2014	There was a catastrophic failure of a dredge winching motor in which pieces of the commutator were ejected through the plastic inspection window. The motor speed control tachometer was disengaged during an inspection allowing the overspeed and failure of the motor to occur.	Mechanical incident
24/05/2014	A 2 tonne vehicle loading crane mounted on a barge adjacent to a floating concentrator moved unintentionally and damaged a hydraulic line allowing an escape of hydraulic oil. The crane controls were damaged previously due to poor plant design and failure to park the crane and shut it down correctly. When the crane was energised it moved immediately due to the damaged control.	Mechanical incident
24/02/2013	During a major flood event, a dredge was found to be anchored perpendicular to the river flow in a listed position with water entering the engine compartment and the cabin.	Partial submersion

Appendix 2 - What is a marine incident?

Marine incidents are defined by relevant Australian laws and include several different types of incidents.

A marine incident may include the following:

- Death of, or injury to, a person associated with the operation or navigation of a vessel.
- The loss or presumed loss of a vessel.
- Collision of a vessel with another vessel.
- Collision by a vessel with an object.
- The grounding, sinking, flooding or capsizing of a vessel.
- Fire on board a vessel.
- Loss of stability of a vessel that affects the safety of the vessel.
- The structural failure of a vessel.
- A close quarters situation.
- A dangerous occurrence, which is an occurrence that could have caused the death of, or serious personal injury to, any person on the vessel.
- An event that results in, or could have resulted in:
    - the death of, or injury to, a person on board a vessel
    - the loss of a person from a vessel
    - a vessel becoming disabled and requiring assistance.
- The fouling or damaging by a vessel of:
    - any pipeline or submarine cable
    - any aid to navigation.
- Other incidents that are prescribed by the regulations include but are not limited to:
    - failure in operation of a component of material handling equipment, whether or not a person is injured because of the failure
    - loss of cargo of a vessel
    - significant damage to a vessel
    - a seafarer is injured or contracts an illness that incapacitates them from the performance of their duty.
- Any serious danger to navigation on or near the course of the vessel.

Further information can be obtained from:

www.amsa.gov.au/vessels-operators/incident-reporting/what-marine-incident

Appendix 3 – Vessel use categories

Area of use/use of vessel	Passenger	Non-passenger	Fishing
Unlimited domestic	1A	2A	3A
Offshore	1B	2B	3B
Restricted offshore	1C	2C	3C
Partially smooth water	1D	2D	3D
Smooth water	1E	2E	3E

Vessel types are:

Class 1— passenger vessels, those that carry more than 12 passengers

Class 2— non-passenger vessels are not class 1 or 3 and may carry up to 12 passengers; and

Class 3— fishing vessels.

Areas of operation are:

A: unlimited domestic operations or those which are greater than 200nm from the coast

B: offshore operations or those which are within 200nm from the coast

B Extended: Extended offshore operations (beyond 200 nautical miles from the baseline of the Australian mainland, Tasmania, a recognised island but within the exclusive economic zone)

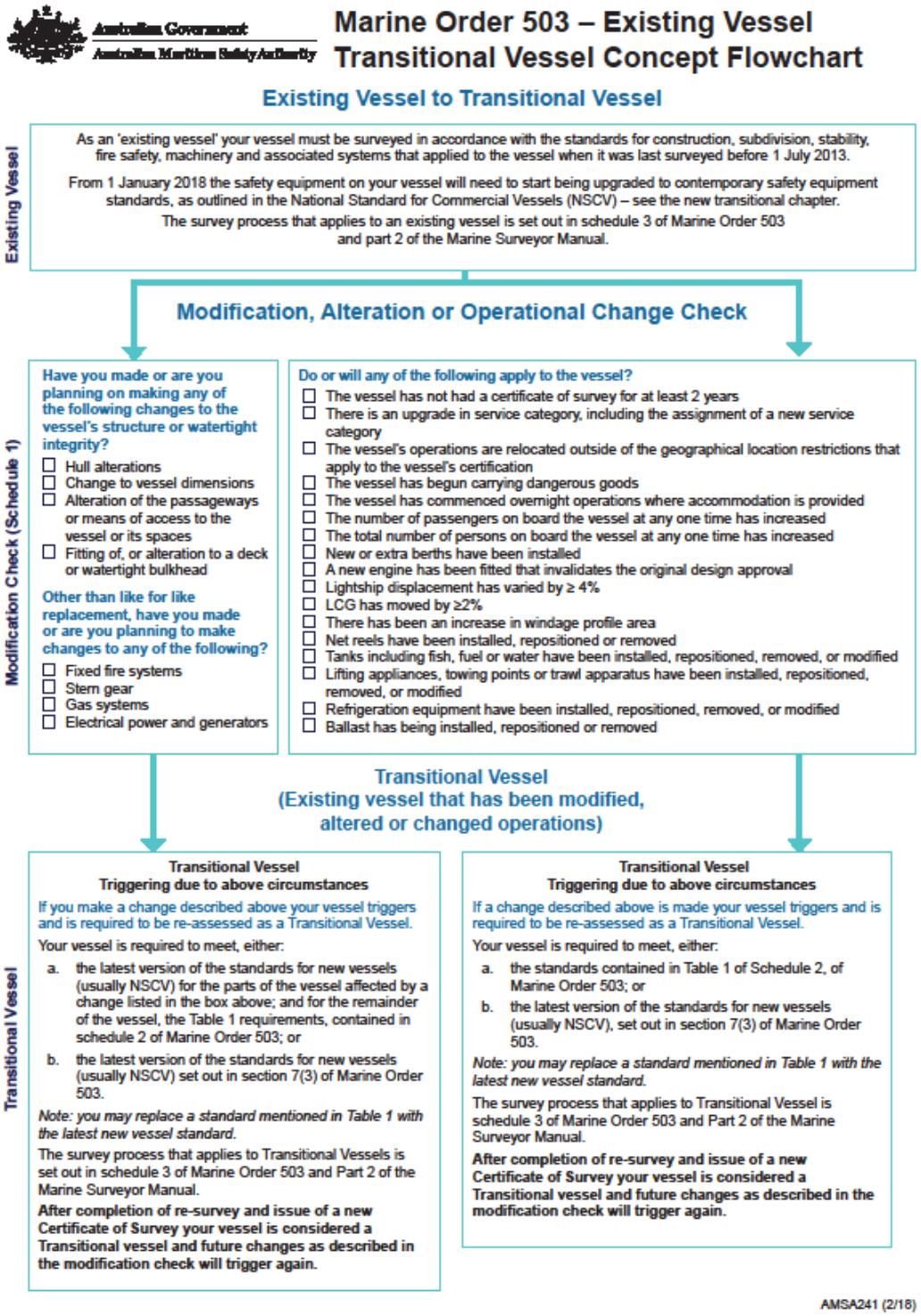
C: restricted offshore operations or those within 30nm from a safe haven, including designated smooth or partially smooth waters or waters designated by a marine authority as being restricted offshore operations

C Restricted: Restricted offshore operations—specified areas

D: partially smooth water operations or those within waters designated by a marine authority where the significant wave height does not exceed 1.5m for at least 90% of the time; and

E: smooth water operations or those within waters designated by a marine authority where significant wave height does not exceed 0.5m for at least 90% of the time.

Appendix 4 – Marine Order 503 flowchart



Flowchart can be found on the AMSA website: https://www.amsa.gov.au/sites/default/files/amsa241.pdf

Appendix 5 - Extract of *Marine Safety (Certificates of operation) Exemption 2018*

15 June 2018

1 Name of instrument
This instrument is *Marine Safety (Certificates of operation) Exemption 2018*.

2 Duration
This instrument commences on 1 July 2018 and ceases to have effect at the end of 30 June 2020.

3 Repeal
Marine Safety (Certificates of operation) Exemption 2017 is repealed.

4 Definitions — dictionary
The dictionary defines certain words and expressions for this exemption.
Note The dictionary is located at the end of the instrument.

5 Exemption from the requirement for certificate of operation

1) Each vessel that is of a kind mentioned in Schedule 1 is exempt from the requirement to have a certificate of operation.
2) The exemption is subject to the conditions mentioned in Schedule 1 for the kind of vessel.
3) However, if under another exemption granted under subsection 143(1) of the national law the vessel does not have to comply with a condition mentioned in Schedule 1 for a vessel of its kind, the exemption for the vessel is not subject to the condition. Example An unpowered barge to which this exemption applies that is exempt from the minimum crewing requirement in Schedule 1 of Marine Order 504 under Marine Safety (Unpowered barges) Exemption 2018.
4) Also, the exemption for the vessel is not subject to a condition mentioned in Schedule 1 for the vessel for a period if:
    a. the owner of a vessel applies to the National Regulator for approval to operate in a way that does not comply with the condition; and
    b. the National Regulator approves in writing the operation of the vessel in the way sought in the application.
5) For an approval under subsection (4):
    a. the period must be not more than 90 days; and
    b. the National Regulator may make the approval subject to further conditions.
6) For subsection (1), if more than 1 Division of Schedule 1 applies to the vessel, the owner of the vessel may choose which Division is to apply.

6 Exemption from conditions attached to certificate of operation

(1) Each vessel mentioned in an item in Schedule 2 is exempt from the condition or conditions attached to a certificate of operation that are mentioned for the item.
(2) The exemption is subject to the conditions mentioned in the item.

Schedule 1 Exemption from the requirement for certificate of operation (section 5)

Division 1 Tenders

Item	Kind of Vessel	Conditions
1.1	Tender	Vessel must: (a) have a parent vessel and be listed in its parent vessel's: (i) certificate of operation; or (ii) safety management system; and (b) have its operational risks addressed either in the parent vessel's safety management system or in the tender's safety management system; and (c) comply with: (i) the operation requirements mentioned in subclauses 6(2) to 6(3), 6(6) to 6(7) and 6(12) to 6(15) of Schedule 1 of Marine Order 504; and (ii) the crewing requirements determined by the National Regulator for the kind of operations to be conducted by the vessel or by vessels of its kind

Division 2 General

Item	Kind of Vessel	Conditions
2.1	A Class 2 or 3 vessel: (a) that is <7.5 m long; and (b) that operates only in sheltered (D or E) waters; and (c) that does not carry: (i) passengers; or (ii) dangerous goods, other than petroleum or gas products intended for use on the vessel or fireworks carried on the vessel only for use on the vessel for a fireworks display; and (d) if a net reel, crane, lifting device or deck load is installed on the vessel: (i) on which the use of the net reel, crane, lifting device or deck load is not likely to adversely affect the stability or watertight integrity of the vessel; and (ii) for which a marine surveyor accredited in stability approval has made a written recommendation to the National Regulator stating that the surveyor is satisfied that the net reel, crane, lifting device or deck load is unlikely to:	Vessel must: (a) have and comply with a safety management system that addresses the operation requirements in Schedules 1 and 2 of Marine Order 504 that apply for the vessel; or (b) comply with Part A of the ISM Code Note For complying with Part A of the ISM Code, the relevant national requirement for crewing is clause 6 of Schedule 1 to Marine Order 504.be conducted by the vessel or by vessels of its kind

	(A) generate a heeling moment that may endanger or capsize the vessel; or (B) create a loading condition that exceeds the maximum loading for the vessel; and (e) that is not operated primarily for towage; and (f) that does not have an inboard petrol engine, other than a personal watercraft; and (g) that is not: (i) a support vessel in the offshore oil or gas industry; or (ii) a fast craft; or (iii) a powered landing barge that is of a design or for a use that the National Regulator has determined is likely to adversely affect its stability; or (iv) a vessel determined by the National Regulator to be high risk. Note for paragraph (d) A recommendation by a marine surveyor accredited in stability approval may have already been provided to the National Regulator to show that the vessel is exempt from the requirement to have a certificate of survey (see Marine Safety (Certificates of survey) Exemption 2017).	
2.2	A vessel, other than a Class 1 vessel, that: (a) is <7.5 m long; and (b) is engaged only in inshore operations; and (c) is used by a sailing school or training organisation to train members of the public for recreational boating qualifications	
2.3	A human powered vessel, other than a Class 1 vessel or a dragon boat	
2.4	A sailing vessel, other than a Class 1 vessel, that: (a) is <7.5 m long; and (b) has no auxiliary engine, or an auxiliary engine of ≤3.5 kW propulsion power	
2.5	A Class 2 or 3 vessel that (a) is a personal watercraft; and (b) does not carry passengers; and (c) is not involved in an aerial freestyle device operation; and (d) is not engaged in towing.	
2.6	A Class 2 vessel that: (a) is involved in sporting and recreational activities; and	

	(b) is affiliated with a body determined by the National Regulator as having systems in place to manage risk; and (c) is engaged only in inshore operations	

A copy of the full extract can be found on the AMSA website:

www.amsa.gov.au/sites/default/files/ex03_2018_-_1_july_2018.pdf