



INDEPENDENT
TRANSPORT
SAFETY
REGULATOR

Implementation of the NSW Government's response

to the Final Report of the Special Commission of Inquiry into the Waterfall Rail Accident

Reporting period: April 2013 - March 2014

REPORT 34



ITSR

Safe transport for NSW

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The Hon. Gladys Berejiklian
Minister for Transport
Level 35 Governor Macquarie Tower
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Dear Minister

I am pleased to provide the first annual report on the implementation of the NSW Government's response to the recommendations contained within the *Final Report of the Special Commission of Inquiry into the Waterfall Rail Accident*.

This report reflects implementation progress from 1 April 2013 to 31 March 2014.

At the close of this period, there are two open recommendations. The Independent Transport Safety Regulator (ITSR) reports publicly on open recommendations.

Recommendations that have been closed subject to implementation of an approved program or plan are monitored as part of ITSR's ongoing regulatory activities to ensure these are fully implemented.

Further information about the history and progress of the implementation of all recommendations can be found on the ITSR website. This information includes:

- copies of previous ITSR quarterly reports
- a document containing all 177 recommendations
- a summary of the 6 recommendations that have been closed subject to the implementation of an approved program or plan.

Yours sincerely

PAUL HARRIS
Chief Executive

Introduction

The Independent Transport Safety Regulator (ITSR) is responsible for overseeing the implementation of the NSW Government's response to the recommendations contained within the *Final Report of the Special Commission of Inquiry into the Waterfall Rail Accident*.

This role includes verifying that recommendations have been effectively implemented or that an approved program or plan is in place for implementation. ITSR has previously produced quarterly public reports on the progress of open recommendations (Report numbers 1 to 33).

Following the publication of the 33rd quarterly report in April 2013, the Minister for Transport accepted ITSR's recommendation to change the frequency of public reporting from quarterly to annually given that the majority of recommendations are now either closed or subject to a long term implementation plan. This report is ITSR's first annual report covering the period from 1 April 2013 to 31 March 2014 (Report number 34).

ITSR will provide the Minister with subsequent reports on an annual basis for the same reporting period (i.e. 1 April to 31 March) for tabling in Parliament. This will detail the status of the remaining recommendations and public reporting on an annual basis will continue until completion of their implementation. All reports are published on ITSR's website.

To enable ITSR to keep abreast of progress on the two open recommendations, ITSR also requires updates on a four monthly basis from Transport for NSW. These assist in the formulation of the annual report on the progress of open recommendations.

Summary of progress

At the end of the reporting period for 1 April 2013 to 31 March 2014, the status of the 177 recommendations (including 127 recommendations and 50 sub-elements) was as follows:

- 2 remain open
- 6 are closed subject to the implementation of an approved program or plan
- 163 are closed and verified as fully implemented
- 1 is closed because it is no longer applicable
- 5 are rejected by the government and these were closed.

The methodology and taxonomy for the classification system used for the Waterfall recommendations are in Appendix 1 and 2 respectively.

The two open recommendations, which are outlined in further detail in Appendix 3, are:

- 32: RailCorp should progressively implement, within a reasonable time, level 2 automatic train protection (ATP). ATP systems provide automatic enforcement (slowing/braking) of authority (speed/location) if a train is behaving in an unauthorised way. Implementation will involve significant infrastructure change and is the subject of a major project.

During the reporting period, there have been further slippages in the key milestones for the ATP program from the originally reported target implementation dates.

TfNSW expected that full Type Approval for the installation of lineside electronic units (a key component of the trackside equipment which acts as the interface between the existing signalling system and the ATP system) would be achieved by 31 March 2014 (instead of February 2013). This milestone has slipped a further 15 months and is now anticipated to be achieved at the end of June 2015.

The issue preventing full Type Approval from being achieved for the lineside electronic units (version 5.1) is related to its use with signals that have flashing aspects. While there are a much smaller proportion of these types of signals, all have been identified as being located at junctions.

TfNSW is addressing this issue with its contractor. The contractor has provided TfNSW with a rectification plan and testing regime to correct the software to ensure that full Type Approval is achieved for the lineside electronic units (version 7.0 with no restrictions) at the end of June 2015. In the meantime, Type Approval with restrictions for the lineside electronic units version 5.1 (i.e. only to be used on signals that don't have flashing aspects) was achieved in April 2014.

The delays in achieving full Type Approval for the installation of the lineside electronic units means that the first OSCAR train fitted with ATP equipment will not be commissioned into passenger service and operate between Berowra and Wyong until September 2015, instead of the first quarter 2015. This is a further slippage of between 6 to 8 months.

The installation of ATP equipment on the first two OSCAR prototype trains was completed together with the data recorder upgrade in June 2013. Reliability testing of the OSCAR prototype trains between Wyong and Gosford was completed in the first quarter of 2014 which identified the need for some minor modifications. Resolution of these modifications is underway and is expected to be completed in May 2014.

During the first quarter of 2014, the first Tangara prototype train was fitted with ATP equipment. Reliability testing is now scheduled to commence in the third quarter of 2014, instead of the second quarter 2014.

As a result of these further slippages to key program milestones, ITSr was concerned that the overall completion date of June 2017 for stage 1 of the ATP program may also be delayed.

TfNSW has advised ITSr that the overall completion date for stage 1 of the ATP program will still be achieved by June 2017. TfNSW has revised its trackside delivery strategy so that construction can commence prior to achieving full Type Approval for the lineside electronic units, reducing the program schedule risk together with increasing the deployment of resources.

- 38: There must be compatibility of communications systems throughout the rail network. It is essential that all train drivers, train controllers, signallers, train guards and supervisors of trackside work gangs in NSW be able to communicate using the same technology.

The target implementation date of 30 April 2015 for completion of the Digital Train Radio System (DTRS) project which includes completion of the DTRS fixed network and fit out of the train cabs (on all Sydney Trains and NSW Trains) has slipped to January 2016. This is a slippage of nine months.

TfNSW has advised ITSR that by July 2015, Sydney Trains' older passenger train fleets will be fitted with DTRS radios. However, this date does not include the installation of DTRS radios on the Waratah (A sets) and Millennium (M sets) passenger train fleets operated by Sydney Trains and NSW Trains.

TfNSW expects that the fit out of the DTRS radios on the Waratah and Millennium train fleets will commence in June 2015 with completion scheduled for late 2015 or early 2016. Therefore, the revised target completion date for the DTRS project is January 2016.

ITSR has also been advised by TfNSW that the July 2015 date (i.e. completion of DTRS radios on Sydney Trains' older train fleets), is of concern due to its contractor's poor performance in the rate of constructing the DTRS base stations, tunnel sites and the completion of software testing (i.e. the integration of three manufacturers' software sub-systems into the DTRS software system).

Completion of the DTRS software testing has delayed the use of DTRS on the Tangara trains fitted with DTRS radios from being introduced into passenger service (Bondi Junction to Waterfall), to February 2015.

To rectify these issues, in February 2014 TfNSW and its contractor agreed on a recovery action plan to improve the delivery of the DTRS project. This resulted in positive progress being achieved through the increased allocation of construction resources assigned to the project.

There are a total of 258 DTRS base station sites, consisting of 209 base transceiver station sites, 28 outdoor tunnel sites and 21 tunnel sites. Of these sites at 31 March 2014, 121 were in the construction phase; 39 had achieved installation acceptance with 30 pending installation acceptance, and 68 to commence construction.

Of the 258 DTRS base station sites, 246 sites require community consultation of which 231 site consultations have been completed and the remaining 15 sites are now scheduled to occur by the end of 2014, instead of July 2013. TfNSW expects that the later date will not impact on the revised system delivery date.

During December 2013, TfNSW commenced fitting the Tangara fleet with dual fitted radios (i.e. a new DTRS radio in addition to the existing analogue MetroNet radio). This will enable Tangara trains in the initial operating sector (Bondi Junction to Waterfall) to be able to switch between the DTRS and MetroNet radio systems as required during the transition period. In January 2014, preliminary on-train fit out work involving the external antennas for the cab radios was completed on all OSCAR train cabs. As at 31 March 2014, 66 of the 225 cabs in the Tangara fleet have been installed with dual fit radios.

The completion of all the detailed designs for the fixed network, on-train installations and systems originally due 31 December 2012 have been revised to 30 June 2014. TfNSW advised that the delay was due to the resubmission of several designs for train radio coverage and some of the tunnel designs which did not meet the requirements of the contract. All system level designs have now achieved a 'Not Rejected' or 'Not Rejected Subject to Comment' status with closure of these comments being closely monitored.

Progress on recommendations

Recommendation 32

In August 2010, the NSW Government gave in-principle funding approval for the rollout of the three stages of RailCorp's (now TfNSW) ATP program and full funding approval for the implementation of stage 1 of the program.

Expected completion dates for the three stages are:

- stage 1 – 2011 to 2017
- stage 2 – 2013 to 2018
- stage 3 – 2015 to 2021.

The system chosen to implement TfNSW's ATP program is the European Train Control System (ETCS). The rollout of this program will be in three stages. Stage 1 involves the supply of ATP equipment for TfNSW's OSCAR and Tangara train fleets and the installation of ATP equipment to 600 kilometres of Sydney Trains' network. Stages 2 and 3 will involve the installation of ATP equipment across the rest of Sydney Trains' electrified network and onboard the Waratah and Millennium train fleets.

In February 2011 RailCorp (now TfNSW) awarded four separate supply contracts including ETCS supply and engineering services for trackside and onboard, and through life support for trackside and onboard.

The trackside supply and engineering services contract includes the provision of lineside electronic units, balises, programming tools, engineering services and engineering support. The onboard supply and engineering services contract includes the provision of driver machine interface equipment, European vital computer equipment, engineering services and engineering support. This contract also includes a trial of level 2 ETCS which was originally planned to be conducted between Sutherland and Cronulla.

TfNSW has advised that the trial will still be conducted as part of the stage 1 ATP program, however, has been relocated to an alternate site between Arncliffe and Hurstville. The new site is more beneficial as the current signalling interlockings can be replaced with commercial off-the-shelf signalling interlockings that are level 2 ETCS compatible involving less technical, developmental and commercial risk.

Level 1 ETCS involves the overlay of ATP on the coloured light signalling system to transmit authorities for trains to proceed on the network via the track mounted balises. Level 2 ETCS involves the connection of ATP to the signalling interlockings to transmit authorities for trains to proceed via GSMR radio. When all trains operating in a Level 2 area are ETCS fitted, the coloured light signalling system may be removed.

The onboard through life support contract commenced in the second quarter of 2012 and will continue until five years after the completion of the ATP installation on the final train covered by the contract. The trackside through life support contract commencement has been further delayed due to Type Approval issues surrounding the lineside electronic units, one of the key components provided under the trackside contract. The trackside through life support contract is now expected to commence at the end of June 2015 (i.e. when full Type Approval is achieved) instead of December 2013.

ATP system testing commenced in June 2012 using the ATP V set test train and the newly commissioned ATP trackside equipment between Gosford and Wyong. This testing allowed TfNSW's configuration of the ATP system to be fine-tuned prior to the second phase of testing using an OSCAR train and a more extensive area of the track in 2014.

During the reporting period, there have been further slippages in the key milestones for the ATP program from the originally reported target implementation dates. TfNSW expected that full Type Approval for the installation of lineside electronic units (a key component of the trackside equipment which acts as the interface between the existing signalling system and the ATP system) would be achieved by 31 March 2014 (instead of February 2013). This milestone has slipped a further 15 months and is now anticipated to be achieved at the end of June 2015.

The issue preventing full Type Approval from being achieved for the lineside electronic units (version 5.1) is related to its use with signals that have flashing aspects. While there are a much smaller proportion of these types of signals, all have been identified as being located at junctions.

TfNSW is addressing this issue with its contractor. The contractor has provided TfNSW with a rectification plan and testing regime to correct the software to ensure that full Type Approval is achieved for the lineside electronic units (version 7.0 with no restrictions) at the end of June 2015. In the meantime, Type Approval with restrictions for the lineside electronic units version 5.1 (i.e. only to be used on signals that don't have flashing aspects) was achieved in April 2014.

The delays in achieving full Type Approval for the installation of the lineside electronic units means that the first OSCAR train fitted with ATP equipment will not be commissioned into passenger service and operate between Berowra and Wyong until September 2015, instead of the first quarter 2015. This is a further slippage of between 6 to 8 months.

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During the first quarter of 2014, the first Tangara prototype train was fitted with ATP equipment. Reliability testing is now scheduled to commence in the third quarter of 2014, instead of the second quarter 2014.

As a result of these further slippages to key program milestones, ITSR was concerned that the overall completion date of June 2017 for stage 1 of the ATP program may also be delayed.

TfNSW has advised ITSR that the overall completion date for stage 1 of the ATP program will still be achieved by June 2017. TfNSW has revised its trackside delivery strategy so that construction can commence prior to achieving full Type Approval for the lineside electronic units, reducing the program schedule risk together with increasing the deployment of resources.

Recommendation 38

This recommendation requires implementation of TfNSW's new digital train radio system (DTRS) and the development of a national communications standard by the Rail Industry Safety and Standards Board (RISSB).

The new DTRS currently being designed will enhance communication between trains and network control in an emergency as well as enable communication between other staff for rail operations on the Sydney Trains' network.

It should be noted that all rail safety workers are currently able to communicate with each other but not using the same technology.

The Australasian Railway Association, in consultation with operators and rail safety regulators, developed a national approach on communications systems to ensure that agreed functionality and compatibility requirements were included in the national railway communications standard developed by RISSB. In December 2010, RISSB published the *Railway Communications Standard – AS7660* for implementation.

The target implementation date of 30 April 2015 for completion of the DTRS project which includes completion of the DTRS fixed network and fit out of the train cabs (on all Sydney Trains and NSW Trains) has slipped to January 2016. This is a slippage of nine months.

TfNSW has advised ITSR that by July 2015, Sydney Trains' older passenger train fleets will be fitted with DTRS radios. However, this date does not include the installation of DTRS radios on the Waratah (A sets) and Millennium (M sets) passenger train fleets operated by Sydney Trains and NSW Trains.

TfNSW expects that the fit out of the DTRS radios on the Waratah and Millennium train fleets will commence in June 2015 with completion scheduled for late 2015 or early 2016. Therefore, the revised target completion date for the DTRS project is January 2016.

ITSR has also been advised by TfNSW that the July 2015 date (i.e. completion of DTRS radios on Sydney Trains' older train fleets), is of concern due to its contractor's poor performance in the rate of constructing the DTRS base stations, tunnel sites and the completion of software testing (i.e. the integration of three manufacturers' software sub-systems into the DTRS software system).

Completion of the DTRS software testing has delayed the use of DTRS on the Tangara trains fitted with DTRS radios from being introduced into passenger service (Bondi Junction to Waterfall), to February 2015.

To rectify these issues, in February 2014 TfNSW and its contractor agreed on a recovery action plan to improve the delivery of the DTRS project. This resulted in positive progress being achieved through the increased allocation of construction resources assigned to the project.

There are a total of 258 DTRS base station sites, consisting of 209 base transceiver station sites, 28 outdoor tunnel sites and 21 tunnel sites. Of these sites at 31 March 2014, 121 were in the construction phase; 39 had achieved installation acceptance with 30 pending installation acceptance, and 68 to commence construction.

Of the 258 DTRS base station sites, 246 sites require community consultation of which 231 site consultations have been completed and the remaining 15 sites are now scheduled to occur by the end of 2014, instead of July 2013. TfNSW expects that the later date will not impact on the revised system delivery date.

During December 2013, TfNSW commenced fitting the Tangara fleet with dual fitted radios (i.e. a new DTRS radio in addition to the existing analogue MetroNet radio). This will enable Tangara trains in the initial operating sector (Bondi Junction to Waterfall) to be able to switch between the DTRS and MetroNet radio systems as required during the transition period. In January 2014, preliminary on-train fit out work involving the external antennas for the cab radios was completed on all OSCAR train cabs. As at 31 March 2014, 66 of the 225 cabs in the Tangara fleet have been installed with dual fit radios.

The completion of all the detailed designs for the fixed network, on-train installations and systems originally due 31 December 2012 have been revised to 30 June 2014. TfNSW advised that the delay was due to the resubmission of several designs for train radio coverage and some of the tunnel designs which did not meet the requirements of the contract. All system level designs have now achieved a 'Not Rejected' or 'Not Rejected Subject to Comment' status with closure of these comments being closely monitored.

Methodology

This section outlines the processes ITSR has instituted to develop and monitor the implementation plan for the NSW Government's response to the *Final Report of the Special Commission of Inquiry into the Waterfall Rail Accident* (SCOI final report).

Implementation plan

ITSR has reviewed the SCOI final report and determined action required to implement each recommendation in line with the government's response and which company or agency has responsibility for that action. These expectations then formed the basis for determining whether the response put forward by a company or agency is appropriate to meet the recommendation and/or satisfy the safety objective of the recommendation. Responsible agencies have assigned indicative timeframes for each safety action and ITSR will review the appropriateness of each. Timeframes agreed with responsible companies or agencies have, to the greatest extent possible, been made realistic and achievable. Details of the implementation plan for outstanding issues and progress against it may be found in Appendix 3.

Classification system for recommendations

In order to provide a graduated view of progress against the implementation plan, ITSR has developed a classification system to indicate the relative status of each recommendation. The taxonomy for the classification system has been drawn from accepted international practice and is listed in Appendix 2.

The process for assigning status to a recommendation is as follows:

- Step 1** The government's response to the SCOI final report determined which recommendations were accepted. ITSR has articulated its expectations in regards to all remaining recommendations.
- Step 2** All accepted recommendations are assigned the status *open – await response*. These recommendations are then referred by ITSR to the relevant company or agency to prepare a response to the recommendation(s) and submit it to ITSR.
- Step 3** ITSR reviews the response and determines whether it is acceptable or not. If it is acceptable then the status of the recommendation is assigned either *open – acceptable response* or *open – acceptable alternative response*. A recommendation would be assigned an *open – acceptable alternative response* status when the intent of a recommendation will be met but will be implemented by alternative means. If the response is not acceptable then the recommendation is assigned the status of *open – response rejected by ITSR*. In this case, the company or agency is informed of the decision and requested to re-submit a revised response taking into account ITSR's concerns. This process continues until the response to the recommendation is accepted by ITSR.
- Step 4** ITSR monitors progress of all accepted responses to ensure a company or agency is meeting agreed implementation timeframes. This is done through both desktop reviews of reports received by agencies and in-field inspections to verify progress claimed.

Step 5 Once a company or agency has completed a required action it will submit to ITSR a claim for closure of the recommendation. This application indicates that the company or agency believes it has completed the required action. The status of the recommendation is changed to *open – company claims closure*.

Step 6 In most cases, ITSR will verify closure through an in-field compliance inspection or audit. Once verification has taken place the recommendation status is changed to indicate it is *closed – action verified*.

Notes:

1 Some recommendations may be verified by examination of documentation submitted by the agency that claims closure rather than through an in-field inspection. In these cases, recommendation status is indicated by *closed – action not verified*.

2 Some recommendations may be verified *closed – subject to the implementation of an approved program or plan*. In these cases, ITSR agrees to closure if the chief executive of the organisation has approved the program or plan and ITSR is of the view that it meets the government's response to the recommendation. This categorisation is used generally when implementation may take place over a prolonged period of time and/or capital expenditure is involved.

This process will continue until all recommendations are closed.

Taxonomy for classification system

Status		Definition
Open	Await response	This status is automatically assigned to an accepted recommendation. Affected parties will be asked to submit their response for implementing the recommendation to ITSR.
Open	Response received	ITSR has received a response from an affected party and this response is under review by ITSR. It has not yet been accepted by ITSR.
Open	Acceptable response	ITSR agrees that the planned action, when completed, meets the recommendation.
Open	Acceptable alternative response	ITSR agrees that alternative action, when completed, satisfies the objective of the recommendation.
Open	Response rejected by ITSR	ITSR does not agree that the planned or alternate action meets the recommendation. The company or agency is advised of the rejection and requested to provide a revised response.
Open	Company claims closure	The company or agency claims that the planned or alternate action has been completed. The action has not yet been verified by ITSR. ITSR has not yet agreed that the item is closed.
Closed	Recommendation rejected	ITSR has determined through further analysis and review that the recommendation is not appropriate (i.e. will not achieve the desired safety outcomes) and has rejected the recommendation. It is therefore closed.
Closed	No longer applicable	The recommendation has been overtaken by events and action is no longer required. For example, a new technology has eliminated the reason for the recommendation, it has been superseded by other recommendations issued, or the operator affected has gone out of business.
Closed	Action verified	Completion of the planned or alternate action has been verified by ITSR through a compliance inspection or audit.
Closed	Action not verified	ITSR accepts that the planned or alternate action has been completed following a review of documentation submitted. Field verification is not necessary.
Closed	Subject to the implementation of the approved program or plan	A long term implementation plan has been approved. ITSR will monitor reported progress against the plan to ensure compliance with delivery schedule.

Appendix 3

Implementation plan: outstanding recommendations

The following section provides information only for recommendations that were closed in the last quarter or remain to be implemented. Those recommendations closed in previous quarters do not appear. A complete list of all recommendations is available on ITSR's website.

The government response and ITSR expectation sections of this table are the formal responses to the SCOI final report announced in February 2005.

Recommendation 32			
RailCorp should progressively implement, within a reasonable time, level 2 automatic train protection (ATP).			
Agency	Status	ITSR assessment	Target date
RailCorp	Open	Acceptable response	+30/06/2015

Government response

Requires further detailed review. The government supports the implementation of additional train protection systems. Implementation of level 2 ATP as detailed in the recommendation would involve the replacement of all line-side signalling on the RailCorp network with on-train control systems. In addition every intra- and inter-state train accessing the network would also need to be equipped with level 2 ATP technology.

RailCorp has already retained consultants to undertake evaluation and risk assessment regarding implementation of additional automatic train protection systems on the RailCorp network. RailCorp will work with the Australian Rail Track Corporation (ARTC) – which operates the interstate network – to develop, in conjunction with ITSR and interstate rail regulators, a national standard for an automatic train protection system.

RailCorp will also undertake a comprehensive review which will include a risk assessment, technical feasibility and cost benefit analysis of introducing level 1 ATP as well as level 2 ATP, as recommended by the Commission. Consistent with recommendation 34 any future options will need to be assessed by independent verification of acceptable risk.

ITSR expectation

A detailed technical review of available options.

This project was originally led by RailCorp until June 2012. On 1 July 2012, responsibility for the delivery of the ATP program was transferred to the Transport Projects Division within Transport for NSW (TfNSW). Most of the former RailCorp staff working on this program have been assigned to TfNSW to ensure no disruption to the delivery of this program.

The major outcome of the project is to be a business implementation of ATP including a trial of level 2 ETCS.

Accordingly, ITSR has deemed that the status of recommendation 32 continue to be classified as *open – acceptable response*.

* This is an indicative timeframe which has been agreed to by the agency responsible and ITSR.

+ This indicates a slippage with a revised date.

This indicates closure – subject to the implementation of an approved program or plan.

Recommendation 38

There must be compatibility of communications systems throughout the rail network. It is essential that all train drivers, train controllers, signallers, train guards and supervisors of trackside work gangs in New South Wales be able to communicate using the same technology.

Agency	Status	ITSR assessment	Target date
ITSR	Open	Acceptable response	+31/01/2016

Government response

Supported and being implemented. The National Standing Committee on Transport endorsed the Australasian Railway Association (ARA) working with operators and regulators, including RailCorp and ITSR, to develop a national approach on communications systems, which has agreed minimum functionality requirements for train radio systems.

RailCorp plans to implement a digital train radio system. An objective of this system is for it to be interoperable with existing analogue radio systems. Because of the technical complexities associated with achieving inter-operability, this has been a longer-term initiative and the first stage of its implementation will commence in 2005.

ITSR expectation

ITSR to ensure functionality and compatibility requirements are included in the national standard developed by the ARA.

This project was originally led by RailCorp until June 2012. On 1 July 2012, responsibility for the delivery of the DTRS project was transferred to the Transport Projects Division within Transport for NSW (TfNSW). Most of the former RailCorp staff working on this project have been assigned to TfNSW to ensure no disruption to the delivery of this project.

ITSR to ensure TfNSW/ARTC radio functionality for next generation technology meets compatibility requirements.

All rail safety workers are currently able to communicate with each other but not using the same technology.

Accordingly, ITSR has deemed that the status of recommendation 38 continue to be classified as *open – acceptable response*.

* This is an indicative timeframe which has been agreed to by the agency responsible and ITSR.

+ This indicates a slippage with a revised date.

This indicates closure – subject to the implementation of an approved program or plan.