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Government
of South Australia

Report

of the

Auditor-General

Supplementary Report

for the

year ended 30 June 2016

Tabled in the House of Assembly and ordered to be published, 20 June 2017

Second Session, Fifty-Third Parliament

Enterprise Pathology Laboratory Information System: June 2017

By authority: Sinead O'Brien, Government Printer, South Australia

2017

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ISSN 0815-9157

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19 June 2017

The Hon R P Wortley MLC
President
Legislative Council
Parliament House
ADELAIDE SA 5000

The Hon M J Atkinson MP
Speaker
House of Assembly
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Dear President and Speaker

Report of the Auditor-General: Supplementary Report for the year ended 30 June 2016: Enterprise Pathology Laboratory Information System: June 2017

As required by the *Public Finance and Audit Act 1987*, I present to each of you my Supplementary Report for the year ended 30 June 2016 'Enterprise Pathology Laboratory Information System: June 2017'.

Content of the Report

Part A of the Auditor-General's Annual Report for the year ended 30 June 2016 referred to audit work that would be subject to supplementary reporting to Parliament. This supplementary report provides detailed commentary and audit observations on a review of the implementation of the Enterprise Pathology Laboratory Information System Program to assess whether it is being delivered on time, on budget and with the planned system functionality.

Acknowledgements

The audit team for this report was Andrew Corrigan and Tyson Hancock.

I also express my appreciation for the cooperation and assistance of staff of the Department for Health and Ageing during the audit.

Yours sincerely

Andrew Richardson
Auditor-General

Contents

1 Executive summary

1.1 Introduction

The Enterprise Pathology Laboratory Information System (EPLIS) is planned to provide the Department for Health and Ageing (SA Health) with a consolidated laboratory information system with functionality across all pathology disciplines. It is to replace the legacy laboratory pathology system, Centricity Cirdan Ultra (Ultra), and other associated ageing systems that are increasingly problematic and costly to support.

EPLIS is expected to enable SA Pathology[1] to standardise end-to-end laboratory workflows, increasing efficiencies and service effectiveness. This includes improved tracking and timely reporting capabilities through electronic visibility of requests, reports and results across the organisation.

Given its importance we have been reviewing the progress of the EPLIS Program (the Program) to gain reasonable assurance that there are sufficient controls to deliver it on time, on budget and with the planned system functionality. The results of our last review were communicated in the Auditor-General's Supplementary Report for the year ended 30 June 2015 'Information and communications technology report: October 2015'.

1.2 Conclusion

Replacing the legacy laboratory pathology information systems is critical for SA Health to deliver a statewide system and support pathology needs at the new Royal Adelaide Hospital (RAH). In doing so, SA Health also has the opportunity to standardise and improve workflow processes across SA Pathology.

Despite progress made since our last review, we found that the Program is currently behind schedule and will not be delivered within the original approved budget.

EPLIS has been implemented at the Women's and Children's Hospital (WCH) with all mandatory system requirements met (as defined by SA Health). However, the effectiveness of the system in operation is yet to be formally tested, with some non-mandatory system requirements still outstanding.

The Program is continuing to work through a number of challenges that have the potential to further impact the rollout to future sites, with some manual workarounds initially required. SA Health advised that EPLIS will not be implemented at a site unless any related critical and high defects are either resolved or have an acceptable workaround for that site.

1.3 What we found

The EPLIS business case[2] indicates that the primary objective of the system is to deliver a

[1] SA Pathology is the state-wide pathology service provider for the public and private health sector.

[2] 'SA Health Enterprise Pathology Laboratory Information System (EPLIS) Final Business Case', Version 1.0, dated 12 May 2015.

statewide laboratory information system to replace the collection of ageing and disparate systems currently in use. Many of these systems are at risk of failure. In addition, due to system limitations the existing systems cannot be further expanded to support the needs of the new onsite pathology laboratory at the new RAH.

By replacing these systems with one integrated laboratory information system, SA Health has the opportunity to standardise and improve workflow processes across SA Pathology. If successfully implemented it will also enable the electronic ordering of pathology through SA Health's Enterprise Patient Administration System (EPAS) and allow the adoption of future technology advances in pathology analyser automation. The end result will be that SA Pathology is better equipped to meet increases in service demands without increasing its cost drivers.

SA Health advised us during our review that it has either remediated or is making progress on all findings raised in our October 2015 Report.

Despite the expected benefits of EPLIS and remediation progress made, our review highlighted the following findings and challenges:

- some gaps in understanding the complex system functionality and data requirements in the build and configure stage
- delays in the billing solution and the potential impact of changed billing arrangements
- underestimating the effort required to complete program activities
- outstanding implementation challenges for the new RAH
- outstanding functional requirements and solution challenges
- risks in the current disaster recovery solution
- support for the main legacy laboratory pathology system database may expire before decommissioning
- customised pathology reporting is yet to be finalised
- approval to destroy original paper copies of patient treatment orders has not been finalised with State Records of South Australia
- data migration and archiving challenges
- lack of segregated system environments
- funding pressures and the lack of a detailed budget to complete all program activities
- benefits realisation plan deficiencies.

Sections 4 to 6 detail our findings and recommendations, and SA Health's responses.

1.4 Response to our recommendations

SA Health provided detailed and positive responses to each recommendation. This included details of their remediation status and approach.

Full remediation of most issues is planned to be completed by December 2017.

2 Program background

SA Pathology provides pathology services to all State public metropolitan and regional hospitals and a number of other private health providers. These services deliver approximately 43% of all community pathology testing funded by Medicare in South Australia.[3]

The 2012-13 State Budget announced the acquisition and implementation of a pathology laboratory information system, replacing Ultra and other associated ageing systems that are increasingly problematic and costly to support.

Ultra is not considered fit for purpose for certain sites, including the new RAH, because it is not fully integrated with other SA Health systems. Due to system limitations it is also not feasible to expand it to support the needs of the onsite laboratory planned for the new RAH.

Following the budget announcement, SA Health conducted the feasibility stage for EPLIS. In September 2014, Cabinet approved funding to enter into a software vendor contract to implement EPLIS. The EPLIS business case was then formally approved in May 2015.

EPLIS is a commercial off-the-shelf application, comprising a number of software modules known as the Cerner Corporation Pty Ltd (Cerner) Millennium Laboratory Information System Suite. Millennium (named EPLIS hereafter) includes a number of integrated modules including, PathNet General Laboratory Anatomical Pathology; Microbiology, Helix, OutReach Services and Blood Bank Transfusion. The system aims to provide inter-operability, visibility and reporting requirements across SA Pathology and is expected to be used by over 1400 laboratory staff.

Since our 2015 review, EPLIS has been implemented at the WCH, with the next implementation in progress at the new RAH (now expected to open on 5 September 2017). SA Health's key objectives for implementing EPLIS remain the same:

- a single system connecting all laboratories across metropolitan and regional South Australia
- standardised and improved workflow processes
- integrated information and a consolidation of systems
- timely access to critical pathology diagnostic information
- harnessing new technology and improving healthcare outcomes for patients and the population.

[3] The May 2015 EPLIS business case stated that these services deliver approximately 37% of all community pathology testing funded by Medicare in South Australia. In the 12 months to June 2013, SA Pathology completed 7.3 million tests.

3 Audit mandate, objective and scope

3.1 Our mandate

The Auditor-General has authority to conduct this review under section 36(1)(a)(iii) of the *Public Finance and Audit Act 1987*.

3.2 Our objective

Our aim in conducting this review was to gain reasonable assurance that sufficient controls have been implemented to conclude that the Program is being delivered on time, on budget and with the planned system functionality.

3.3 What we reviewed and how

We assessed a number of program controls, and obtained an update on the current status of the Program's implementation, budget and expenditure to date.

We also assessed some key risks and the system's impact and readiness for the first go-live sites.

Our review has involved relating with SA Health representatives from the Program and SA Pathology.

3.4 What we did not review

When we started our review the EPLIS implementation at the WCH was still in progress. It has since been implemented at a number SA Pathology laboratories located at this site. We have not performed any operational control testing of the system in operation.

4 Implementation status

What we found

The Program has continued to operate within the governance principles and guidelines set out by the eHealth Program Management Office. The EPLIS Program Board has continued to provide overall program responsibility, including approval of deliverables.

The first implementation at the WCH was completed on 28 March 2017. At the time of our review, implementation at the new RAH was being progressed.

SA Health stated that it has either remediated or is making progress on all findings raised in our October 2015 Report.

Despite this progress, challenges have led to delays in the rollout schedule. These include:

- some gaps in understanding the complex system functionality and data requirements to support the build and configure stage of EPLIS
- delays in the billing solution and the potential impact of changed billing arrangements
- underestimating the effort required to complete program activities
- outstanding implementation challenges for the new RAH.

What we recommended

The Program should:

- continue to develop its knowledge and documentation of the underlying EPLIS system functionality and data requirements
- complete a billing (invoice) matching exercise as soon as practicable to identify the potential impact of changed billing arrangements
- confirm and plan the rollout schedule for the remaining in-scope sites
- identify and detail all known activities to complete the Program and provide the outcomes to its governance committees
- continue to diligently manage resource planning
- continue to ensure that all planned development and testing activities are finalised before the rollout of EPLIS at the new RAH.

4.1 Rollout update

The rollout of EPLIS is planned for a number of directorates and sites within SA Pathology, including eight metropolitan hospitals, 11 regional laboratories and 65 collection centres (38 metropolitan and 27 regional). The most recent rollout schedule was aligned to meet the required new RAH milestone dates.

The proposed rollout schedule in the approved May 2015 business case ran from April 2016 to May 2017. It was expected that all metropolitan sites would be completed by October 2016. The new RAH was originally planned to be the first rollout site in April 2016.

As a result of the delay in opening the new RAH, the Program revised its rollout schedule in December 2015 to undertake a pilot at the WCH's SA Pathology facility in July 2016. The final site was expected to go live in late-May 2017.

Further delays were then experienced with the new RAH and other program milestones, including closing out the plan and design stage. This was mainly due to documentation delays, approved increases in scope and issues identified during the testing process.

These delays have resulted in the Program rescheduling the rollout time frames on more than one occasion.

The Program implemented EPLIS at its first site, the WCH, on 28 March 2017. At the time of our review, the Program had not formally updated its rollout schedule to all in-scope sites, however it had performed some scenario planning. This planning was mostly based on the timing of the rollout to the new RAH, which is now expected to open in September 2017.

Issues and challenges relating to the program delays and the underlying causes are outlined in section 4.3.

4.2 Program improvements since our last Report

The Program has continued to operate within the governance principles and guidelines set out by the eHealth Program Management Office. The EPLIS Program Board has continued to provide overall program responsibility, including approval of deliverables. Under this arrangement the eHealth Steering Committee provides program oversight and the EPLIS Program Operations Control Team (EPOCT), which includes SA Pathology managers, acts as an advisory group to the Program.

Our review identified some notable improvements since our October 2015 Report, including:

- the development of documentation previously noted as outstanding by the eHealth Program Management Office
- a detailed test strategy and accompanying test plans including unit, system, user acceptance testing, integration and billing
- a detailed change impact assessment of activities at the WCH

- operational support, deployment and planning for system go-live
- a detailed vendor management plan
- frequent program and vendor monitoring meetings including the fortnightly EPOCT meeting and the monthly Cerner Partnership Liaison meeting
- detailed tracking of the program work package, deliverables and vendor tasks.

SA Health's progress on remediating our previous findings is further detailed in Appendix A.

Despite these improvements, we have raised a number of matters in this Report that need attention.

4.3 Factors contributing to program delays

4.3.1 Some gaps in understanding the complex system functionality and data requirements in the build and configure stage

Recommendation

The Program should continue to develop its knowledge and documentation of the underlying EPLIS system functionality and data requirements to support the program's build, configure and test activities.

Finding

EPLIS is highly configurable and has required extensive data configuration work (design and entry of data and rules to drive outputs) by SA Health and Cerner. This work is subject to a large number of business rules, calculations and validations by the EPLIS software engine to derive expected outputs. Furthermore, each EPLIS module processes information differently and some system modules can impact others in their operation.

As a consequence, the Program maintains a high level solution design document that was developed during the program feasibility phase. It defines the system's internal functional components and their respective responsibilities, interactions and operational characteristics. In addition, based on information provided by SA Pathology subject matter experts, Cerner provided around 200 complex data workbooks that required completion in order to populate data into the system. These subject matter experts were responsible for collecting this data, but it also required extensive consultation with each pathology directorate.

Despite this documentation, we were advised that the build and configure stage was sometimes conducted with an insufficient understanding of the data and how all functional components worked together. This resulted in some re-configuration and re-testing that has impacted the program schedule.

We were advised that potential underlying causes included:

- turnover of subject matter experts in some areas
- project work having to be incorporated with the subject matter experts' day-to-day laboratory testing work, which had to take priority
- subject matter experts having system access to explore its operations, but without a sufficient understanding of the data they were collecting and how it would ultimately be used in the system
- a number of vendor provided data configuration templates needing redesign after configuration works started
- modifications to the original EPLIS build being needed due to the complexities of the collected data and changes requested by the business.

SA Health response

SA Health acknowledged this finding and advised that there were some issues in the early stages of the Program, but that these were addressed and the system was successfully implemented in the WCH in March 2017.

Knowledge transfer sessions and formal training sessions facilitated by the software vendor to subject matter experts continue to be undertaken with the benefit of continuing to enhance knowledge of the system functionality and data requirements.

The Program will continue to develop its knowledge and documentation of the underlying EPLIS system functionality and data requirements to support the Program's build, configuration and testing activities. This is an ongoing activity.

4.3.2 Delays in the billing solution and the potential impact of changed billing arrangements

Recommendation

SA Health should ensure that the planned billing (invoice) matching exercise is completed as soon as practicable to identify the potential impact of changed billing arrangements.

Finding

One objective of the EPLIS implementation is adopting a more effective automated billing process for public patients and the private sector. The Program advised that the full EPLIS solution cannot be implemented without a functional billing solution.

In our October 2015 Report, we identified the reliance on a fully functional billing solution for the first go-live site. At this time, Phase 1 of the PowerBilling and Revenue Collection (PBRC)

Billing Project,[4] had been significantly delayed from late 2014 to August 2015. This was mostly due to the increased level of configuration and testing work required to meet SA Health requirements.

In October 2015 we recommended that the Program identify billing contingency options in a timely manner, with established key decision points. SA Health responded that Phase 1 of the PBRC Billing Project went live on 1 October 2015 and that the solution was now up and running and no contingency option was required. Phase 2, involving interfacing with EPLIS, commenced in October 2015.

Since that review, PBRC has been implemented within SA Health and is interfaced with Ultra. However, the Program has experienced a number of issues in configuring the billing solution to receive data from EPLIS. The extent of the configuration effort required was underestimated as it was assumed there would be minimal configuration changes required to ensure it correctly receives billing information from EPLIS. In addition, a more complex testing cycle was required than initially planned. These billing issues were one of the main causes of previous delays in rolling out EPLIS to the first site at the WCH.

The new billing solution being implemented with EPLIS changes the way billing occurs and the timing of bills being produced. Currently Ultra produces a bill on completion of each individual patient test. Billing in EPLIS will be generated when an encounter (visit) is completed and the patient is discharged. This can change the timing of tests being billed and subsequent payments being made to SA Pathology.

We were advised that the Program is undertaking a revenue matching exercise to compare billing samples between the current Ultra-PBRC billing result and the EPLIS-PBRC billing result to provide assurance over the total revenue volumes that are generated in the new billing environment.

SA Health response

EPLIS and the billing solution were implemented successfully in the Women's and Children's hospital in March 2017 and the billing components are operating as expected.

The billing revenue matching exercise is underway and will be completed prior to the next site deployment. This activity is targeted for completion by July 2017.

4.3.3 Underestimating the effort required to complete program activities

Recommendation

The Program confirm and plan a rollout schedule for the remainder of in-scope sites.

The Program should identify and detail all known activities to complete the remainder of the program including activation at each site and ensure resources are allocated accordingly.

[4] Although SA Heath considers the PBRC Billing Project to be a separate project, it is funded as part of the EPLIS Project and is a critical dependency. This phase involved building the billing solution and interfacing with Ultra.

The Program provides the relevant governance committees with clear estimates to complete all program activities so timely and informed decisions can be made.

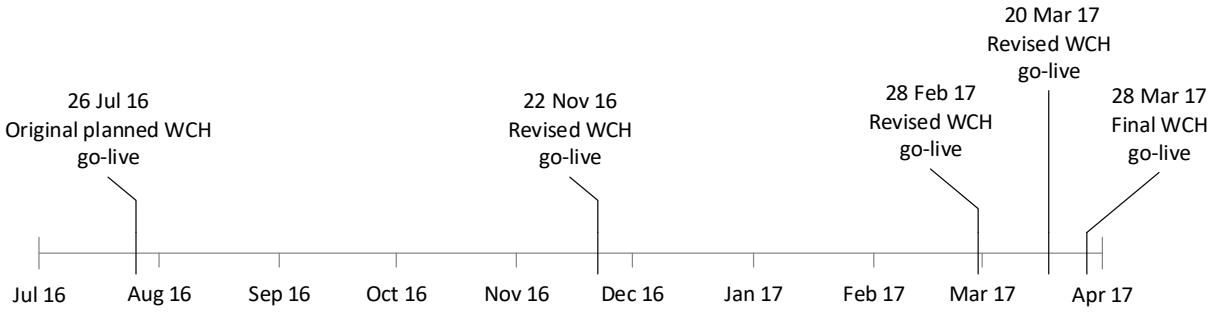
Finding

The EPLIS rollout was originally scheduled to occur from April 2016 to May 2017. It was expected that all metropolitan sites would be completed by October 2016, with implementation at the new RAH in April 2016.

Rollout to the new RAH has been affected by uncertainly about the opening of the hospital. Rollout to other SA Health sites has also been delayed. This includes the WCH, which was rescheduled four times.

Delays in the rollout to the WCH are summarised in figure 4.1.

Figure 4.1: WCH rollout delays



The delays were primarily due to issues with the billing system and key risks associated with building and testing of Automated Chemistry and viewing of pathology results, which are electronically distributed to other SA Health systems.

Overall program delays have related to increased configuration and testing time frames due to the system's complexity and approved scope changes. This includes issues identified during system integration and user acceptance testing, and the billing solution.

In November 2016, the Program proposed a number of potential rollout dates for the remaining in-scope SA Health sites, following implementation at the WCH (at that time, planned for February 2017) and the new RAH (scenario planned for May 2017).[5] These potential rollout dates included:

- regional sites – during July 2017
- Lyell McEwin Hospital/Modbury Hospital/The Queen Elizabeth Hospital – during August 2017
- Flinders Medical Centre/Noarlunga Hospital – during September 2017
- laboratories located on Frome Road – October 2017

[5] The new RAH is now expected to open in September 2017.

The Program noted that these dates were originally pending a firm opening date for the new RAH. At that time, SA Health advised that these potential rollout changes will require the Program to be extended at an estimated additional cost.

Since the new RAH opening has now been announced, this proposed rollout will need to be reconfirmed and the impact on the program's closeout finalised.

SA Health expects that all system components will have been completed and most in production by the time the new RAH implementation is completed. We acknowledge this reduces the expected effort required to implement the system at subsequent sites.

There is still a reasonable amount of work required to ensure a successful implementation at each site. Based on the implementation experience at the WCH, and learnings in the program, SA Health advised that it is likely that each site will have a different time period to prepare for go-live. These will be determined as each go-live is planned. For example, the new RAH has a preparation time of 22 weeks, but some sites are now expected to need around eight weeks. Activities in this preparation period include:

- discovery activities to analyse each site's current people, processes and systems
- activation activities including communications, end user training, data migration, instrument and peripherals testing, business acceptance testing and a go-live readiness assessment
- go-live activities such as activating new workflow practices, granting user access and transferring laboratory operations
- hand-over to post go-live support teams.

As such, the Program may experience resourcing challenges to complete multiple site activation activities simultaneously to meet its potential rollout dates.

SA Health response

The Program completed a rollout schedule and obtained approval from the relevant governance committees based on a July 2017 opening date for the new RAH. This is now being revised for the recent announcement of a September 2017 opening date.

On completion, the rollout schedule, related activities and resourcing requirements will be provided to the Program's governance committees so that informed decisions can be made. This activity is targeted for completion by June 2017.

4.3.4 Outstanding implementation challenges for the new Royal Adelaide Hospital

Recommendation

SA Health should continue to diligently manage its resource planning.

SA Health should continue to ensure that all planned development and testing activities are finalised before rolling out EPLIS at the new RAH. Activities required for completing initial operations at the new RAH should be appropriately prioritised with resource planning in advance. Frequent communication and urgency should be emphasised with dependencies (SA Health and external parties).

Finding

SA Health advised that the May 2017 Program risk register contained 10 active risks, of which three were considered extreme, six high and one moderate. After it considered preventative and mitigating controls, the risk profile was reduced, with controlled risk ratings counted as four high, five medium and one low.

The Program and Cerner are also continuing to work through 178 identified system defects across the full solution. The defects have been rated as zero critical, 16 high, 98 medium and 64 low. The Program has defined a 'defect' as any non-conformance in the work product to the approved business requirements and/or specifications.

We acknowledge that most ICT system implementations will experience issues, enhancement requests and defects being raised throughout the lifecycle. However, SA Health advised that EPLIS cannot be implemented unless all critical and high defects are either resolved or have an acceptable workaround for that site.

SA Heath advised that it continues to monitor all requests to resolve system defects and these have been prioritised according to go-live requirements.

The Program's briefing in December 2016 to the eHealth Steering Committee advised that all system components will be completed following the rollout to the new RAH. At the time of our review, the Program was still working through a number of challenges that have the potential to further impact the rollout and require manual workarounds. These challenges continue to be managed in the Program's risk register. Examples include:

- the Program is awaiting advice of the new point-of-care testing[6] devices to be used at the new RAH. As such, point-of-care pathology workflows and the extent of work required to interface these testing devices with EPLIS are not yet known.

  If not resolved, EPLIS will reject pathology results where a patient has not yet been registered in the system. This may occur when point-of-care testing is performed before admitting a patient or there is an incorrect patient identifier. This has the potential to result in lost patient records and revenue

- the ordering of blood products for transfusions using EPAS will not initially be implemented at the new RAH. In the interim, current paper-based processes will be required to order blood products, however the transfusion status will be returned to EPAS as part of the results record.

[6] Point-of-care testing is conducted at the time of a patient consultation, to provide a pathology test result for an immediate clinical decision.

Other notable challenges for the new RAH implementation being managed by the Program are discussed throughout this Report. In summary they include:

- outstanding build items and defects required for initial operations at the new RAH
- outstanding user acceptance testing for system aspects including Microbiology and Infectious Diseases, Anatomical Pathology, Cellular Therapies and Serology
- outstanding testing between other systems and external registers, including EPAS for electronic ordering and results viewing, the State Cancer Registry, Cervical Cancer Registry, Infection Control, Notifiable Conditions, Antenatal and Neonatal Screening
- developing and testing medical device interfaces required for laboratory analysers.

SA Health response

In planning for implementation of EPLIS at the new RAH, all required development and testing activities have been prioritised and scheduled to ensure completion prior to the opening date for the hospital. The specific challenges mentioned are all known and work is actively being progressed to be ready in time for the new RAH. Regular meetings are held with other SA Health project teams where there are dependencies to ensure activities are aligned.

SA Health will ensure that it continues to diligently manage its resource planning. The Program maintains a resource plan which supports the Program's planned activities. As activities change, the resource plan is updated and presented to the relevant governance bodies for approval. This is an ongoing activity.

5 System functionality

What we found

EPLIS is a commercial off-the-shelf application, comprising a number of software modules. The application is planned to provide inter-operability, visibility and reporting requirements across the SA Pathology business. SA Health anticipates it will also enable SA Pathology to standardise end to end laboratory workflows and deliver increased efficiencies and service effectiveness.

Despite the potential benefits, there were some original Request for Proposal (RFP) requirements that EPLIS has not been able to address. The Program has continued to work through a number of challenges to meet SA Health requirements, including various functionalities, workflows and other system implementation related activities.

These challenges include:

- a number of functional requirements and solution challenges remain outstanding
- risks in the current disaster recovery solution
- support for the main legacy laboratory pathology system database may expire before decommissioning
- customised pathology reporting is yet to be finalised
- approval to destroy original paper copies of patient treatment orders has not been finalised with State Records of South Australia
- data migration and archiving challenges
- lack of segregated system environments.

What we recommended

- The Program should continue to allocate time and resources to ensure it follows up outstanding items with all responsible parties.
- SA Health should consider the broader impacts in the unlikely event of a disaster and its position on the appropriateness of the current disaster recovery solution. This includes the appropriateness of the business continuity plans of affected business units.
- SA Health should continue to consult with the Ultra system vendor (Cirdan) about its ongoing use of Ultra.

- SA Pathology should ensure that customised reporting is developed to support SA Health hospital sites and associated laboratories.
- SA Health should finalise formal approval from State Records of South Australia to destroy documents after scanning.
- SA Health should continue to address the data migration challenges and the data archiving strategy.
- The Program should reconsider the current process for configuration and testing activities.

5.1 System functionality issues and reduced time frames for required action

5.1.1 A number of functional requirements and solution challenges remain outstanding

Recommendation

The Program should continue to allocate time and resources to address the outstanding functional requirements.

The Program should follow up the outstanding items with all responsible parties, emphasising those with a higher risk to the next planned go-live sites. The status of these items should be frequently reviewed through the EPOCT.

Finding

Following a tender process, SA Health approved Cerner as the EPLIS supplier. SA Health advised that although Cerner was the preferred tender, there were some RFP requirements that EPLIS did not address.

In December 2016 the Program undertook a requirements traceability exercise to review the original RFP requirements against EPLIS. This identified that all mandatory requirements could be met, however there were a number of non-mandatory requirements that remain outstanding. Of the total RFP requirements SA Health has assessed the current status as shown in figure 5.1.

Figure 5.1: Status of RFP functional and non-functional requirements

Requirement status	Functional requirements[7]	Non-functional requirements[8]
Fully compliant	945	449
Alternate workaround (alternate workflow)	115	18
Partially compliant (some workarounds required)	47	14
Solution gap (Cerner response 'compliant'; but no solution available yet)	15	-
Does not comply (Cerner response 'non-compliant'; no workaround available)	45	15
Not required (requirements are no longer required/valid)	22	-
Out of RFP scope (requirements issued in RFP, but subsequently taken off tender or not priced)	70	-
Total	1 259	496

Of the 15 solution gaps, nine were rated highly desirable, four desirable and two optional. Of the items identified that do not comply, nine were rated highly desirable, 27 desirable and nine optional.

In addition, our review of the Program's risk register identified a number of items that have been outstanding for a long time. The following items require resolution by either the Program or SA Pathology. We have been advised that the Program continues to progress them:

- testing of the EPLIS interface with EPAS and the EPLIS workflow for EPAS discharge orders
- an Electronic Data Interchange solution to feed EPLIS results to external general practitioners to maintain private revenue. This includes resolving pathology results being repeated when sent through this external Electronic Data Interchange
- business governance and knowledge relating to clinical data extracts to external parties

7 The functional requirements describe the core business functionality required of EPLIS. They include requirements around functional build, workflow, data, interfaces, regulatory compliance, quality control and billing.

8 Non-functional requirements define the overall qualities or attributes of EPLIS. They include security, usability, reliability and performance requirements.

- it is currently unknown if a sufficient level of data extraction and sample storage retrieval can be performed running EPLIS to satisfy data extraction requests for pathology testing validations/studies/recalls

- the robotic track system required for the Microbiology laboratory at the new RAH requires a two-way interface to communicate with EPLIS. We were advised that in the interim a one-way interface is available from Cerner and will be accepted by SA Pathology for the initial implementation at the new RAH. The one-way interface will allow specimens to be processed using the laboratory track system and analysers, however full automation of the testing process will not occur until the two-way interface is implemented

- interface testing for notifiable conditions reporting (*South Australian Public Health Act 2011*), SA cancer registry reporting (*South Australian Health Commission Action 1976*) and infection control reporting (SA Health's statewide infection control reporting of healthcare associated infections). Other outstanding reporting tasks are raised in section 5.1.4.

In addition, we note that the current version of EPLIS requires the system to go offline for one hour at the winter daylight saving time change. Until this is resolved, SA Health is required to follow business continuity procedures during this hour.

SA Health response

EPLIS was implemented successfully at the WCH with essential functionality. Specific items mentioned in the finding are all being actively progressed by the Program.

All mandatory functional requirements identified in the RFP are met by the solution being implemented. Other requirements continue to be reviewed with SA Pathology and, if still required, are being investigated to determine if an acceptable solution is available with the Program's budget and time frame. The status of these matters is discussed at the fortnightly EPOCT meetings.

SA Health will continue to review scheduled time and resources to address the outstanding functional requirements. This is an ongoing activity.

5.1.2 Risks in the current disaster recovery solution

Recommendation

SA Health should consider and review the broader impacts, including how it plans to manage the operations of all impacted business units for a sustained period of time, when pathology services are operating at less than 5% of normal productivity.

At the conclusion of this review, should SA Health determine that the risks are not acceptable, it should reconsider its position on the appropriateness of its disaster recovery solution.

In the event of a significant disaster at SA Health's primary data centre causing a major hardware or software failure affecting EPLIS, impacted business units should have appropriate business continuity plans to ensure that processing of pathology tests can continue.

Finding

EPLIS has been designed as a high availability solution in a single data centre. As a result, it needs to be highly resilient to any critical hardware failures, such as failed servers, disks and communications infrastructure. Agreed service targets to restore a disruption to service are:

- the recovery point objective is 15 minutes
- a maximum tolerable period of disruption is six hours.

We were advised that resilience has been built into the EPLIS infrastructure to ensure continuity of a safe and timely service.

In addition, SA Health advised that a backup solution has been designed that is capable of achieving the 15 minute recovery point objective stated in the design specification. This is to be achieved by performing frequent back up to disk of all database logs, which will then be backed up to tape on a daily basis. The storage solution where the logs will be copied has a high level resilience built into its architecture.

Despite this resilience, a catastrophic failure at the primary data centre would potentially render the system inoperative for more than six hours. However, the cost of implementing a secondary data centre, estimated at $2.489 million with an annual recurrent cost of $596 000, was not part of the original EPLIS budget.

We noted that addressing this matter was the subject of numerous SA Health discussions at the Board and Program level. SA Health concluded that the risk of the primary data centre being inoperable for an extended period was low. In addition, sufficient mitigating controls existed, such as the backup solution and business continuity plans that can be activated while services are restored. Hence the cost of implementing a secondary data centre site was not considered justifiable given the risk profile.

In assessing this risk, we do not dispute SA Health's assessment that the likelihood of the entire data centre being subject to catastrophic damage is low. However, an exception report provided to the EPLIS Program Board in April 2016 described the clinical impact of a system failure if a full disaster recovery solution is not implemented for EPLIS, including:

- when IT-enabled automation in the pathology work processes is removed, manual pathology 'business continuity' measures provide less than 5% of normal productivity. This level of productivity can only support acute services and areas of high acuity

- running a business continuity plan beyond the maximum acceptable outage time causes unacceptable levels of disruption to the overall hospital system

- failure of an enterprise statewide pathology system disables SA Health's pathology services across the State
- the health system is highly dependent on pathology outputs to operate in a business as usual environment supporting patient flow and optimal outcomes
- an extended outage of the SA Pathology IT system would result in patient safety concerns, decreased patient flows, bed blocking at all hospital sites, cancellation of elective theatre lists and recalling patients for specialist outpatient appointments. In addition, delays would be experienced for general practitioner appointments due to the unavailability of diagnostic results or the inability to request or perform diagnostic tests.

In particular, the exception report stated:

> *to fully understand the financial impact of this scale of disruption requires a significant piece of work; however it is not unreasonable to assume the impact would have the potential to run to millions of dollars...*[9]

SA Health response

The relevant SA Health governance bodies have already considered the impacts and determined that the risks were acceptable given the unlikely event of a catastrophic failure.

SA Pathology will review the impacts of an EPLIS disaster scenario and will develop appropriate business continuity plans. This activity is targeted for completion by September 2017.

5.1.3 Support for the main legacy laboratory pathology system database may expire before decommissioning

Recommendation

SA Health should continue to consult with the Ultra system vendor (Cirdan) about the potential continued use of Ultra past 2017 and ensure the data archive strategy considers this matter.

Finding

Our review of the September 2016 Board minutes noted commentary that SA Pathology had been advised that the Ultra database would not be supported by Cirdan past December 2017. Hence there is only a short period of time before the legacy database is not vendor supported.

[9] 'Exception Report #5: EPLIS Disaster Recovery Solution', eHealth Systems, SA Health, July 2016, page 4.

The risk of running an unsupported database is increased by SA Health's plans to continue to use Ultra to access historical patient results after EPLIS is implemented. Until legacy data is appropriately archived, Ultra cannot be decommissioned.

At the time of our review, SA Health advised it had obtained a quote to convert the database to a read only format to maintain access to historical patient results. This was subject to finalisation and approval of a data archive strategy and business case.

SA Health response

SA Health will continue consultation with the Ultra system vendor (Cirdan) about the potential continued use of Ultra into 2018 and has developed a data archive strategy that is currently under review to consider this matter.

This activity is targeted for completion by December 2017.

5.1.4 Customised pathology reporting is yet to be finalised

Recommendation

SA Pathology should ensure that customised reporting is developed to support SA Health hospital sites and associated laboratories.

Finding

We enquired about the status of pathology reporting to meet both clinical and management requirements.

SA Health advised that only standard management reports will be provided initially for the first go-live sites. This occurred for the WCH deployment.

We were also advised that all clinical reporting has been developed for SA Health's specific requirements, including both paper based and electronic presentation. However, at the time of our review, some clinical reporting was yet to be fully tested and approved for implementation. Examples for implementation at the new RAH include:

- information to help clinicians conduct Serology and Microbial testing[10]

[10] Serology involves demonstration of seroconversion, which compares the current result to the previous result, to indicate current or recent infection or vaccination. Microbial testing involves assessing the presence of micro-organisms such as bacteria causing disease or fermentation. This creates diagnostic difficulties and increased reliance on laboratory comments. Source: http://www.intertek.com/microbiology/ and https://www.boundless.com/microbiology/textbooks/boundless-microbiology-textbook/diseases-15/diagnosing-microbial-diseases-167/diagnosing-microbial-diseases-830-10823/ , viewed 9 February 2017.

- reporting to notify the requesting doctor when there are significant rises in titres.[11] Examples include infections or diseases, such as syphilis, legionella and Q fever, that are commonly referred to as 'notifiable conditions' to the Communicable Disease Control Branch.[12]

Customisation of non-standard clinical and management reporting required for each site will be developed over time.

Until all required customised reporting has been developed, there is a risk that the data captured in EPLIS will not be readily available for management decision-making. SA Health advised that it would not implement EPLIS at an SA Health site without all required clinical reporting.

SA Health response

All required clinical reporting for tests conducted by each specific laboratory is developed and tested prior to that laboratory going live so that it is readily available to clinicians for patient care.

Management reporting and external reporting to parties outside of SA Pathology is being progressively developed as needed. This is an ongoing activity.

5.1.5 Approval to destroy original paper copies of patient treatment orders has not been finalised with State Records of South Australia

Recommendation

SA Health should finalise formal approval from State Records of South Australia to destroy documents after scanning.

Finding

As part of our review, we requested the Program's position regarding EPLIS compliance with State Records of South Australia.

To be considered a compliant business system, certain metadata must be attached to scanned documents before the original paper copy can be destroyed.

SA Health initially planned to adopt existing workflows at each hospital site for handling original paper copies of requests for pathology tests.

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[11] The quantity of antibody present in an organism.

[12] Under the *South Australian Public Health Act 2011* medical practitioners and pathology services must inform SA Health of cases (including deaths) suspected of having, or diagnosed with, a notifiable condition, as per the fact sheet for Health professionals 'South Australian Notifiable Conditions or Related Death: Information for Health Professionals', version 2, August 2016.

For WCH this included destroying the original paper copies once they were scanned into EPLIS. However, to destroy original paper copies SA Health is required to ensure EPLIS is a compliant business system.

At the time of our review, formal approval from State Records of South Australia had not been received. In response to this issue, SA Health advised it is progressing this matter and in the interim will retain original paper request forms.

SA Health response

SA Health is working with State Records of South Australia to complete the necessary approval to destroy the paper pathology request forms after they are scanned into EPLIS.

This activity is targeted for completion by September 2017.

5.1.6 Data migration and archiving challenges

Recommendation

SA Health should continue to address data migration challenges, including any further extension of the legacy data migration or interface developments.

SA Health should ensure it addresses the data archiving strategy to ensure it can realise the planned benefits from decommissioning the legacy laboratory pathology information systems.

Finding

Documentation gaps in data migration planning to assist immediate patient care

SA Health plans to migrate some legacy system data into EPLIS based on business requirements. This includes Blood Bank, Anatomical Pathology and some Serology patient data, primarily past results. Our review of the data migration strategy documentation found that it did not cover the following aspects:

- access controls to ensure data integrity is maintained during the data conversion process
- a documented back-out plan in the event the conversion is not successful
- a data maintenance plan for any data updates and adjustments required post go-live.

Advice provided by SA Health indicated that a complete historical data migration was not planned due to the cost and complexity of mapping pathology data from legacy systems to EPLIS. It was not considered practical or feasible. As such, the option chosen was to migrate only the data needed for immediate patient care.

We were subsequently advised that for some country sites, SA Health is holding discussions to either migrate further legacy data from Ultra to EPLIS or develop an interface between these systems. SA Health has submitted a request to Cerner to propose a suitable inbound results interface between Ultra and EPLIS.

Data archiving

In our October 2015 Report, we noted that the approved EPLIS business case did not include funding to implement a data archiving strategy that is compliant with regulatory requirements. SA Health advised it was investigating cost options and developing a strategy to address the archiving of historical data. A preliminary cost estimate made in the May 2015 EPLIS business case was $3.6 million.

As part of this review, we sought an update on the data archiving strategy. SA Health advised that a formal strategy has been documented and a business case has been developed for approval.

The benefits of decommissioning a legacy laboratory pathology information system cannot be fully realised until the legacy data is appropriately archived. We were advised that these benefits will be quantified in a future business case.

SA Health response

SA Health will continue to address the data migration challenges including any further extension of the legacy data migration or interface developments.

Data migration test plans have been developed to cover how each data migration occurs. They include the bulk upload before users have access to that part of the system, ability to restore to an original copy if needed and how any updates are implemented post go-live. The process has been successfully used at the WCH. All currently approved data migrations are expected to be completed as part of the new RAH deployment. This activity is targeted for completion by September 2017.

A data archiving strategy and business case has been developed and will be submitted to the appropriate governance committees for approval. This activity is targeted for completion by October 2017.

5.1.7 Lack of segregated system environments

Recommendation

The Program should reconsider the current process being adopted for configuration and testing activities, to ensure that configuration activities do not adversely impact system testing.

The Program should ensure that final testing of changes is done in a segregated environment.

Finding

The Program has conducted core configuration and pre-production testing activities in the same environment. This approach would not be an issue if these separate activities were being conducted in isolation.

However, we noted that as defects were being raised and fixed in testing cycles other configuration activities continued to occur simultaneously in the same environment. This potentially reduced the effectiveness of system testing before changes were placed into production. This was the situation at the WCH.

To address this issue, the Program advised that an additional environment to support pre-production testing will be implemented.

SA Health response

A separate logical systems environment has been in operation since 26 May 2017 to allow configuration and testing to be conducted in different domains. This environment will be used for the final testing prior to migration to production.

6 Budget and expected benefits

What we found

It is important that a program of this size and nature maintains appropriate oversight and monitoring of budget activities and expected benefits.

At the time of this Report, SA Health was expecting the budget to be exceeded, with the estimated additional costs to complete all program activities yet to be fully determined.

The key benefit of implementing EPLIS is to replace Ultra and other associated ageing systems. These legacy systems are increasingly problematic and costly to support. EPLIS is also expected to provide standardised workflows and deliver increased efficiencies and service effectiveness.

The Program maintains a benefits realisation plan to track key benefits. However, our review noted that most of these expected benefits did not contain sufficient detail of benefit estimates, timing and planning for realisation.

What we recommended

- The Program should update the budget estimates to include all activities required to complete the Program.
- The Program should provide its governance committees with clear estimates of the expected costs to complete all program activities so timely funding decisions can be made.
- SA Health should review the expected benefits. This includes confirming benefit estimations and timing for realisation, validating assumptions and planning how they will be realised.

6.1 Summary of the Program budget and a status update

6.1.1 Initial budget

We noted in our October 2015 Report that a budget of $30.365 million was announced in the 2012-13 State Budget to procure and implement EPLIS. In September 2014 Cabinet approved:

- $1.1 million for initial non-vendor feasibility costs

- $11.4 million to execute the contract and incur expenditure with the vendor (Cerner) over five years (2014-15 to 2018-19). This includes $9.4 million from within the existing SA Health budget allocation and an additional $2 million to be funded from SA Pathology's ongoing operating budget

- $19.9 million to incur expenditure for non-vendor components over three years (2014-15 to 2016-17).

6.1.2 Modifications to budget

The Program has continued to report to the EPLIS Program Board that the current budget may be insufficient to satisfactorily complete all requirements and deliver the full expected benefits of EPLIS to SA Pathology.

In our October 2015 Report, SA Health acknowledged that further works were to be undertaken that exceeded the remaining contingency funds. These works included electronic pathology ordering, archiving legacy system data and implementing a secondary site disaster recovery solution.

SA Health has since opted not to implement a secondary site disaster recovery solution. Although this reduces some budget pressure, SA Health is accepting the risks of operating EPLIS from a single data centre (refer section 5.1.2).

We were advised that in April 2016, Cabinet approved a contract variation with Cerner for the provision of additional services to support the implementation of EPLIS up to $2 million within the total approved budget. This increased the total contract cost with Cerner to approximately $14.5 million over five years (2014-15 to 2018-19).

The purpose of the contract variation was to provide additional vendor activities that were not originally specified in the contract with Cerner, including the level of detail to identify certain mandatory reporting requirements. It also included addressing some solution gaps made from incorrect assumptions made at the time of early contract development.

The Program advised that this additional contractual expenditure could be offset by internal Program infrastructure savings.

6.1.3 Current budget

A summary of the Program budget and expenditure as of April 2017 is provided in figure 6.1.[13]

[13] The expenditure to date figures were provided by SA Health and have not been audited. Only capital figures have been included.

Figure 6.1: Program budget and expenditure to April 2017

	Original approved budget (September 2014) $'000	Revised approved budget (April 2017) $'000	Expenditure to date $'000	Remaining budget $'000
Phase 1 – Program capital and operation expenditure	1 941	1 193	1 193	-
Phase 2 – Program capital and operation expenditure	24 080	[14]30 450	24 449	6 001
Contingency	3 556	-	-	-
Total budget	29 577	31 643	25 642	6 001

A revised program budget of $33.057 million has subsequently been approved, with the additional amount funded internally by SA Health. This budget revision will be applied to expenditure from May 2017.

An additional $2 million is being funded from SA Pathology's ongoing operating budget for ongoing recurrent costs related to Cerner subscription fees and support.

Due to the EPLIS implementation, SA Pathology forecasted further incremental increases in recurrent expenditure of $7.137 million from 2014-15 to 2018-19. This includes a period where new system costs exist while legacy systems remain active before decommissioning. SA Pathology is required to identify expenditure offsets to absorb this increase in recurrent costs as there is no budget supplementation. At the time of our review, we were advised that there was still no solution as to how this budget deficit will be recovered.

6.2 Program budget and expected benefit challenges

6.2.1 Funding pressures and lack of detailed budget to complete all program activities

Recommendation

The Program should update its budget to include all activities required to complete the remainder of the Program.

The Program should provide its governance committees with clear estimates of expected costs to complete all program activities so timely funding decisions can be made.

[14] This amount includes the remainder of phase 1 expenditure, transfer of allocated contingency funding and other funding from within SA Health.

Finding

Since our October 2015 Report, the Program has continued to report budget pressures to its governance committees. They mainly relate to accommodating scope changes and delays in finalising and testing the solution, including the billing solution and additional development and configuration work conducted by the system vendors. These budget pressures are documented in the Program's monthly status reports and risk register.

Our review of the Program's budget estimates noted that only high level costs have been calculated to the end of June 2017. These estimates include resources and contractors, goods and services, travel, infrastructure and vendor related expenses. The budget does not contain detailed information or mapping to the activities and types of resources needed to complete activities for the remainder of the program.

We acknowledged in our previous Report that the Program expected a significant portion of the budget to be expended by the time the first site rollout was completed. SA Health advised that the majority of expenditure would be attributed to solution implementation and not apportioned across each site.

This was reiterated in a Program briefing in December 2016 to the eHealth Steering Committee, which noted that a rapid deployment of EPLIS is planned following implementation at the new RAH. At that stage, it expects that all system components will have been completed and most in production. However, this briefing acknowledged that the full rollout would not be completed by the Program's current end date of 30 June 2017.

An exception report was presented to the eHealth Steering Committee in December 2016, indicating the Program would need to be extended at an additional cost.

While we acknowledge the Program's high level scenario planning, which has been constrained by the new RAH, we believe the Program should provide additional detailed planning of the estimated extent of effort required to complete all program activities. These site activities may include:[15]

- developing and testing of medical device interfaces required for laboratory analysers located at sites
- completing the development, interfacing and testing of the billing solution
- developing and testing other outstanding items as part of the EPLIS build and other related components
- business impact assessment
- training, change activities and user access configurations
- cutover planning
- data migration activities.

[15] SA Health advised that the extent of these activities will depend on the site.

In addition, we note that no budget planning past the end of June 2017 is currently reported in the Program's budget tracking produced to its governance committees. This therefore does not accurately reflect the Program's current budget position and provide the relevant governance committees sufficient detail to make informed decisions impacting the Program.

At the time of this Report, SA Health was yet to determine the estimated additional costs to complete all program activities.

SA Health response

The Program prepared a revised budget to support completion of the remainder of the Program which was approved by the relevant governance committees. This budget is being reviewed due to a recent announcement about the opening date of the new RAH.

On completion, the budget will be provided to the relevant governance committees so that funding decisions can be made. This activity is targeted for completion by July 2017.

6.2.2 Benefits realisation plan deficiencies

Recommendation

SA Health should review the expected tangible benefits of EPLIS to ensure they are achievable and adjust accordingly based on the revised rollout time frames.

In doing so, where monetary tangible benefits are expected, we recommend SA Health ensure that each expected benefit contains clear estimations of the extent of benefits and timing for realisation, as well as planning for how these expected benefits will be realised.

We recommend that SA Health ensure that tangible and intangible benefits are clearly identified, with assumptions validated.

Finding

In our October 2015 Report, we noted the Program did not have a formal benefits realisation plan. A benefits realisation plan was completed and approved in June 2016.

In reviewing this plan, we noted it contains a number of tangible benefits. We identified that most of these expected benefits do not contain clear estimations of the extent of benefits and timing for realisation or planning for how they will be realised. In addition, there is no formal review process documented that includes timing for assessment to ensure benefits are on track to be realised.

The May 2015 EPLIS business case included staff savings of nine FTEs. Despite this, we were advised that consultation with key SA Pathology stakeholders identified there was minimal analysis of how these FTE savings were originally derived. In addition, the implementation of a Pathology Efficiency Programme may already include these EPLIS pathology savings. As such there may be some double counting in the EPLIS benefits realisation plan.

SA Health's June 2016 benefits realisation plan stated that EPLIS was expected to deliver a net operating expenditure saving from 2017-18 and $854 000 p.a. from Year 5 (2018-19). At the time this plan was approved, the EPLIS rollout was planned to commence soon after in July 2016. However, EPLIS did not go live at the WCH until March 2017.

SA Health has incorporated these expected Program benefits into SA Pathology's ongoing budget. Until these expected benefits are realised, offsets from other budget savings may be required, such as the Pathology Efficiency Programme.

We also noted that a number of the benefits have a direct dependency, including the full rollout of EPAS and implementation of electronic ordering, interfacing with the billing system and a sufficient disaster recovery solution to support system availability requirements.[16]

Many of the documented benefits may not be adequately measured in monetary terms and therefore meet the criteria of intangible benefits. We acknowledge, however, that some benefits have a link to the monetary benefit related to staff savings.

SA Health response

SA Health will review the benefits realisation plan, and consider the SA Pathology Efficiency Programme, as part of its standard project management processes. This activity is targeted for completion by September 2017.

[16] Further details about the disaster recovery solution that has been adopted are provided in section 5.1.2.

Appendix A - Update on prior review findings

This table provides a brief status update on the findings reported in the Auditor-General's Supplementary Report for the year ended 30 June 2015 'Information and communications technology report: October 2015'.

Prior review finding	SA Health's original response (October 2015)	SA Health update response (May 2017)[17]
Detailed findings – potentially impacting the new Royal Adelaide Hospital		
Program delays have occurred	SA Health responded that EPLIS will continue to operate as per the recommendations. The schedule is monitored and reviewed monthly by the EPLIS Board. Exception reports regarding any material deviations to the program schedule and/or scope are prepared as required and are endorsed by the EPLIS Board and approved by the eHealth Steering Committee.	The EPLIS Program has and will continue to operate as per the original response.
Lack of staff familiarity with EPLIS and associated workflows	SA Health will continue with these strategies as recommended, including maintaining robust governance. The EPLIS Communications and Stakeholder Management Strategy and the Testing Strategy have now been approved by the EPLIS Board. Other strategy documents such as the Change Management Strategy and the Training Strategy will be developed over the coming months. The target completion date is November 2015.	SA Health has and will continue to maintain robust governance as per the original response. A range of planned project activities and artefacts have been completed since the original response including those identified ie the Change Management Strategy and the Training Strategy.
Integration challenges potentially resulting in delays and workarounds	SA Health responded that the schedule review being undertaken by the EPLIS Program team will take into account the opportunity to bring EPLIS integration activity into the SOC testing time frames where possible, within the	All required interfaces with SA Health and third party systems for the first EPLIS deployment at the Women's and Children's Hospital were completed prior to go-live and are now operational.

[17] SA Health's updated responses have not been audited.

Prior review finding	SA Health's original response (October 2015)	SA Health update response (May 2017)[17]
	constraints imposed by external dependencies (including the EPAS Program and procurement of new instrumentation for the new RAH laboratories). The schedule review will also place priority on required interfaces with other SA Health and third party systems. The target completion date is November 2015.	Further interfaces with other systems including EPAS are now being finalised in time for the new RAH deployment.
Electronic pathology ordering integration with EPAS is yet to be finalised	SA Health responded that the EPLIS Program will continue with the activities as per the recommendations. This will be an ongoing process.	SA Health is continuing with the activities as per the recommendations. The required order and results catalogues have been built in the EPLIS and EPAS systems and testing is underway.
Integration challenges with PowerHealth Billing & Revenue Collection	SA Health responded that Phase 1 of the PBRC Billing Project went live on 1 October 2015 and as the solution is now up and running (including disaster recovery), no contingency option is required. Phase 2, which involves interfacing with EPLIS, commenced in October 2015. The target completion date is currently being determined as part of the EPLIS schedule review.	The billing system PBRC has been interfaced with EPLIS as part of the Women's and Children's Hospital deployment in March 2017.
Procurement of the laboratory instruments and robotic tracks is yet to be finalised	SA Health responded that the EPLIS Program will continue with the activities as per the recommendations. This will be an ongoing process as the program liaises closely with the new RAH procurement team.	SA Health is continuing with the activities as per the recommendations. Procurement of the robotic track systems was finalised in 2016 with the instruments being installed at the new RAH during that year. Other instrumentation procurements have progressively been finalised in time ready for the new RAH opening.

Prior review finding	SA Health's original response (October 2015)	SA Health update response (May 2017)[17]
Detailed findings – general program issues		
EPLIS budget and contingency may be insufficient to finalise all required program activity	SA Health responded that the EPLIS Program is working on assessing the cost for the three items flagged in the final business case as potentially needing funding from contingency. The EPLIS Program and the EPLIS Board will continue to monitor budget expenditure closely. The EPLIS budget position is reported as part of the monthly Program Report to the governance bodies. These activities are ongoing as the program progresses.	The EPLIS Program is continuing to monitor budget expenditure closely. The EPLIS' budget position has continued to be reported to the appropriate governance bodies. Additional details if required are presented in the EPLIS Program Director's monthly commentary report or through Briefing Notes. All requests for the release of contingency funding have been made through Exception Reports. A revised budget for the EPLIS Program was approved in April 2017.
Financial reporting and governance requires improvement	SA Health responded that the EPLIS Program Director will specifically address the financial status in the monthly board reporting. SA Health will ensure minutes and meeting papers of the EPLIS Board's deliberations on budget matters are recorded in more detail in future to provide evidence of budget governance oversight. The target completion date is October 2015.	SA Health has completed improvements to reporting and governance. Financial reporting and governance has been strengthened through more detailed monthly reporting to the governance bodies.
Lack of tracking and potential delays of program benefits realisation	SA Health responded that the EPLIS Program has addressed the recruiting challenges with the appointment of a program resource to manage these activities. The EPLIS Program is currently drafting the benefits realisation plan, as well as establishing the baseline for the future	The Benefits Realisation Plan has been completed and approved by the relevant governance bodies.

Prior review finding	SA Health's original response (October 2015)	SA Health update response (May 2017)[17]
	measurements. Benefits realisation will be monitored on a monthly basis in time for the first go live (as no benefits will be materialised prior to the rollout commencing). The target completion date for the benefits realisation plan is December 2015.	
Ongoing resource challenges exist	SA Health responded that the EPLIS resource plan is being actively managed on an ongoing basis.	Resource needs are actively monitored in line with the Program's needs and documented in a Resource Plan. Resource constraints or issues are escalated as required.
Pathology results reporting challenges to maintain private revenue	SA Health responded that the EPLIS Program will undertake the work required to configure and test the Electronic Data Interchange interface as per the EPLIS Program schedule. A replacement Electronic Data Interchange solution may be considered in due course. These activities are ongoing as the EPLIS Program progresses.	SA Health has completed the development of the required interface to distribute pathology results to the private revenue market using SA Health's EDI system as part of the first site deployment at the Women's and Children's Hospital on 28 March 2017. Consideration of a replacement EDI solution is ongoing.
Program activities continued without a formally approved EPLIS business case	SA Health responded that the EPLIS governance bodies will monitor the EPLIS Program against the May 2015 business case and ensure any deviations are managed by exception reports. These activities are ongoing as the EPLIS Program progresses.	SA Health will continue to monitor the EPLIS Program against the EPLIS Final Business Case. Any deviations have been managed by Exception Reports.