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Closing the Gaps in Good Manufacturing Practices Compliance along the Blood Supply Chain in APEC Economies

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Final Project Report

Reference: APEC Project No. CTI 30 2016A LSIF: *Closing the Gaps in Good Manufacturing Practices Compliance along the Blood Supply Chain in APEC Economies*

BACKGROUND

Following successful engagements in the APEC LSIF Blood Supply Chain Partnership Training Network (BSC-PTN)'s activities in 2014 and 2015, Viet Nam's National Institute of Haematology and Blood Transfusion (NIHBT) volunteered to host and lead a series of BSC-PTN's activities from 2016 through 2017. NIHBT had identified Good Manufacturing Practice (GMP) as its priority focus for its BSC-PTN activities and it was agreed that work would begin in November 2016 with a series of training programs held at five (5) regional blood banks.

After the onsite training programs, a two-day GMP workshop would be held at NIHBT in December 2016. The workshop would review GMP theory and discuss putting theory into practice in Viet Nam's blood banks. The workshop would then be followed by an APEC Policy Forum on GMP which would include speakers and participants from other APEC Economies.

PROJECT METHODOLOGY

Initially it was planned that there would be one trip to each of the 5 nominated Blood Centres in Viet Nam. A second round of trips was subsequently included to review the progress that had been made since the first trip, and to assess the success of the project. This follow-up trip took place 12 months after the first.

Trip 1 (31 October – 05 November 2016)

- An initial assessment of current practices against the requirements of Good Manufacturing Practice (GMP) was carried out over one week at each Blood Centre to identify gaps in compliance.
- A report was provided to each Blood Centre listing nonconformances to be addressed, together with recommendations on corrective actions and prioritisation. These were distributed in January 2017.
- GMP training was provided to staff at each Blood Centre, using the assessment findings as case studies and examples.
- Responses to the reports, together with timeframes for corrective actions, were submitted by the Blood Centres for review and feedback.

Trip 2 (30 October – 02 November 2017)

- A follow-up review of progress made in addressing the GMP compliance gaps was carried out at each of the Blood Centres over 2 to 3 days. NOTE: as the length of the visit did not allow a full assessment of all activities or all gaps, the review focussed on the recommendations and priorities from the first report.
- In addition to progress made, consideration was also given to:
  - ✓ Sustainability of the corrective actions
  - ✓ Staff engagement after 12 months
  - ✓ Level of GMP knowledge retained
  - ✓ Ongoing plans at the Centres

- A final report on review findings, including any new nonconformances identified, was provided to each Blood Centre in January 2018.
- Further GMP training was provided, based on topics identified by each Centre as having caused difficulty in either comprehension or implementation.

SELECTED BLOOD CENTRES

The Blood Centres nominated to take part in the project were:

- National Institute of Haematology and Blood Transfusion (NIHBT) – Ha Noi
- Hue Blood Centre – Hue*
- Blood Transfusion Hospital (BTH) – Ho Chi Minh City
- Cho Ray Hospital – Ho Chi Minh City
- Can Tho Blood Centre – Can Tho

*The second review visit to Hue was compromised by extreme flooding that resulted in staff having to be sent home and closure of the Centre for half a day.

TRIP 1 OUTCOMES

During the first trip, it became apparent that there was a significant variation in practices between the 5 Centres. Staff were all aware of GMP, but had little or no understanding of its principles. However, staff generally had a better understanding of quality management system (QMS) principles and the 3 larger Centres had appointed Quality Managers and made some progress in implementing a QMS.

The Centres had also worked towards implementing ISO 15189 *Medical laboratories – Requirements for Quality and competence* into their Transfusion Transmitted Infections (TTI) testing laboratories and the differences between practices in these laboratories compared with other departments, particularly the Processing departments, were obvious. The laboratories generally had better control of processes and good records, however they were still not fully compliant with GMP requirements.

The physical condition of most of the Centres did not meet GMP requirements for reducing risks of contamination and errors through good workflows and regular cleaning regimes. The TTI laboratories were all in better condition but the Processing departments often had the most serious issues. Mobile venues also presented high risks to components and materials.

With the exception of one Centre that had very good processes in place, processes were largely uncontrolled and inconsistently performed by staff. Several were high risk and reported as critical priorities to be addressed.

Critical issues identified:

- *Sample collection:*

  In two Centres, a closed system was not maintained during collection of the samples, creating a high risk of contamination of the donation.

- *Component release:*

  Not all TTI and confirmation of blood grouping test results were checked for each component before it was released for use. One Centre did not use release labels at all.

- *Traceability/Label control:*

Critical labels were not well controlled, with a high risk of mix-up between donors. One Centre did not use printed barcoded donation numbers, and donation numbers had to be manually transcribed numerous times, with a very high risk of error.

- *Storage facilities:*

  Storage of materials in all Centres was poorly managed and storerooms were generally untidy, unclean and not temperature monitored. Storage of blood components was also poor, with no regular cleaning, de-icing and monitoring of temperatures and alarms for stand-alone and walk-in facilities. In one Centre, the walk-in freezers could not be entered by staff because of an excessive and overflowing volume of plasma.

- *Buildings & premises:*

  The physical conditions of work areas and work surfaces did not allow good, safe workflows or adequate cleaning.

- *QMS:*

  Key elements that are fundamental to GMP requirements were not in place, for example change control, validation, qualification, and incoming inspections and acceptance testing for materials.

- *Open Processing:*

  Open processing was performed in several Centres, sometimes under unclean and uncontrolled conditions.

- *Donor haemoglobin:*

  Levels were not assessed in two Centres, posing a health risk for the donor.

There were a few issues that were common to all Centres:

- *Quarantine:*

  Quarantine of non-released blood components separated from released components was not controlled. There was no formal quarantine of incoming materials before inspection and release for use.

- *Confirmation of ABO Rh(D) Grouping:*

  Confirmation of blood grouping was carried out poorly, with no reverse group performed in one Centre and no records of the results of groups carried out on donation segments in other Centres.

Training:

Training was delivered each afternoon. The program covered a general introduction to GMP, followed by a more detailed review and discussion of each requirement. The visits to the various departments during the mornings, and the issues identified, were used to illustrate practical application of GMP principles.

Staff were generally very engaged with the training. However, it was a challenge for them to understand the differences between GMP and QMS and how they should be integrated. This is not an uncommon problem where a Blood Centre already has a QMS in place and is planning to implement GMP.

There were also two logistical challenges. Firstly, it was difficult to adequately cover all GMP requirements in five half days and the amount of information made it difficult for the Centres to absorb and retain it all. Secondly, Viet Nam does not have a Code of GMP, nor has one been identified for future use, so training had to be based on general principles common to all Codes of GMP for Blood rather than a specific Code applicable to Viet Nam.

TRIP 2 OUTCOMES

The Blood Centre responses to the Trip 1 Reports proposed very ambitious timelines for actions and this comment was provided back to them. The concern was that corrective actions would be implemented too quickly to be effective and/or sustainable.

It became obvious during the second trip that the Centres had significantly underestimated the amount of time and effort that would be required for the corrective actions. As a result, many of their proposed timeframes had not been met.

However, all Centres had made some progress and plans were in place for further improvements, focussing on continuing to address the critical and major issues. The two Centres that had not had Quality Managers in place, have now appointed staff to the role, but only recently. Consequently, there has been little development of the QMS in those Centres.

The level of improvement across the Centres has been variable, but this was influenced by:

- *Funding:*

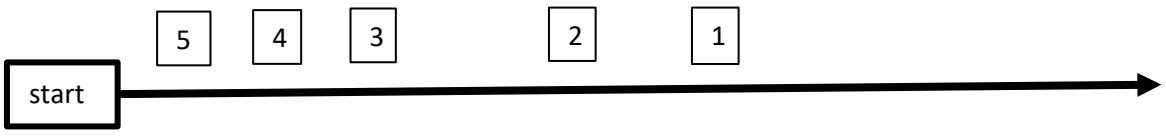
  The funding available differed from Centre to Centre. One Centre in particular appeared to have to compete with its Hospital for funding and as a result, was comparatively poorly funded. Its funding level had a direct impact on the number of critical issues identified initially and the level of progress between Trips 1 and 2.

- *Resources:*

  The level of resources available reflected the level of funding. In the Centre referred to above, staff were required to carry out multiple roles across different departments.

- *Number and seriousness of nonconformances initially identified.*

- *The starting point for each Centre on the quality/GMP journey, depicted graphically as follows:*



Key improvements noted:

- *Buildings and Premises:*

  The biggest improvements across all Centres were seen in the condition of buildings and premises.

  Cracked and chipped flooring has been replaced and work benches either have or are being replaced with sealed work surfaces that can be cleaned properly. Wooden furniture and plants have been removed and workflows reorganised to improve efficiency and reduce errors.

  The biggest improvements have been in the Processing areas, with change rooms now ensuring that all staff and visitors must change into protective clothing before entering the manufacturing area. The level of cleaning throughout the Collection, Processing and Testing areas has also improved, including good cleaning behind and under equipment.

  Storage of materials in most Centres has improved with better organisation of goods, and some Centres have designated areas for quarantine and released goods.

  Environmental temperatures are now monitored & recorded in most work areas, although staff need to take action when out-of-specification temperatures are recorded.

- *Sample Collection:*

The two Centres that did not maintain closed blood collection systems during sampling have now introduced blood bags with sample collection pouches and as a result, sample collection is no longer high risk for contamination.

- *Component release:*

  Release of components is now well controlled in most (but not all) Centres. Improvements to the process have included computerised checking or manual double-checking, and ensuring a one-way flow of components during the labelling process.

- *Control of critical donation number labels and traceability:*

  Label control of donation numbers has improved but only one Centre has introduced full reconciliation and disposal of unused numbers. Most Centres have introduced better separation of work areas at adjoining donor bedsides to reduce the risk of paperwork and labels being mixed-up between the 2 donors. Records and traceability to reagent lot numbers are improving but have a long way to go.

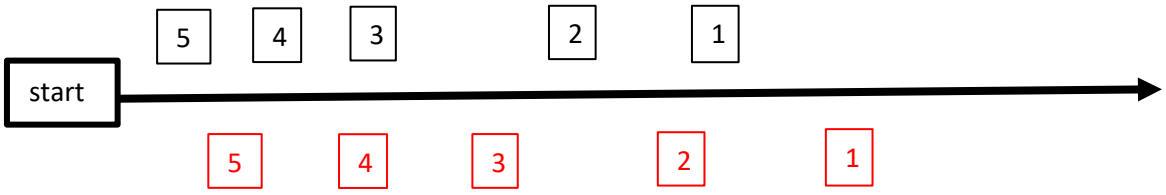
- *Storage facilities:*

  Component storage facilities are now monitored and recorded, and most have regular cleaning programs in place. Temperature probes have been identified and where possible, lagged, in some Blood Centres. The storage of blood components has been improved in all Centres, with quarantine components clearly separated from released components.

- *Quality Management System:*

  Quality Managers have recently been appointed into the two Centres that did not have the role in place. The other Centres have been focussing on developing and implementing the key GMP quality systems of Change Control, Validation, Qualification and Risk Management. These systems generally caused the most difficulty in understanding how to apply them in blood manufacturing, and were nominated for refresher training during Trip 2 by all Centres.

The comparative improvements by the Centres is shown in red in the following graphic:



Key Issues yet to be resolved:

Given the amount of time and effort it takes to implement GMP, it is not surprising that there are still a number of key issues that need to be addressed. These will take time and resources and it is crucial that the Centres continue the momentum they have built up. The most important remaining issues include:

- *Mobile venues:*

  Unsuitable venues that are dirty and pose a high risk for contamination need to be replaced slowly with more suitable ones.

- *Equipment:*

  Programs need to be established for regular servicing and calibration of critical equipment including apheresis machines, blood centrifuges, storage facilities.

- *Quality Control:*

  Sampling numbers are not statistically significant, nor do they cover all components made, equipment used or sites of collection. This has been due to cost concerns related to volume of reagents needed for testing, and loss of some donations through destructive testing.

- *Donation number labels:*

  One Centre is still using handwritten donation numbers.

Sustainability:

Many of the improvements implemented have been recent and staff are still familiarising themselves with them, however most of the important changes appear to be well planned and therefore sustainable.

A small number of very recent changes have not been successful but these were discussed and further work identified to correct them.

Staff Engagement 12 months on:

The senior management at all Centres are still committed to improving blood quality and safety through implementation of GMP, however there is a high level of concern about the costs of implementation and the lack of sufficient funding. There was also some reluctance to make any changes that required transfer of activities from one area to another, or to change the long-held practice in most of the Centres of confirming blood groups by performing a forward group (unrecorded) on a segment from every donation.

Generally, the rest of the staff appeared to be engaged both in learning about GMP and in the implementation activities, taking great pride in the improvements that had been made in the 12 months since Trip 1.

Level of GMP Knowledge:

Much of the basic knowledge imparted last year appears to have been retained, however continuous GMP training will be crucial to sustaining the new culture. Most of the retraining requested during Trip 2 related to the more complex GMP QMS systems of Change control, Validation, Qualification and Risk Management.

Future Challenges:

The Blood Centres have worked hard to make a good start on implementing GMP but it will be a challenge for them to continue to implement without adequate funding.

Regulation of blood and blood components is an essential consideration for the future to provide the driver for continued effort, and to achieve the significant improvements in blood component quality and safety that GMP implementation brings to Blood Centres. Regulation would also bring the recognition from funding sources that compliance activities should be supported fiscally. The biggest challenge facing the Blood Centres, therefore, is gaining Government support for the establishment of a Code of GMP, updating of their Blood Standard, and relevant changes to the Ministry of Health regulations. NIHBT will need to take the leading role in negotiations with the Government.

Finally, an issue of great concern, and disappointment, relates to the project recently initiated by NIHBT whereby the smaller Blood Centres are being encouraged to implement the ISO 9001 Standard for QMS within very short timeframes. Although the training that is being provided by NIHBT will help the Centres to implement a QMS, it will be a challenge for the Centres to keep their focus on GMP. ISO 9001 implementation will not deliver the improved safety in manufacturing processes that GMP does, and is likely to cause great confusion for staff.

CONCLUSION

GMP implementation has commenced in the 5 Blood Centres that participated in the pilot study and the many improvements have already reduced identifiable risks and improved safety. Maintaining focus and momentum on continuing the implementation will be critical, and the Centres do have the tools to do so. Most of the changes should be sustainable. The risk here is the potential for the NIHBT ISO project to distract the Centres from GMP.

Funding and recognition of GMP from the linked Hospitals are significant issues, and policy changes at Government level needs to be a priority.

The APEC Roadmap Implementation Pilot in Viet Nam has been a success

GMP Assessment Follow-up Report

Can Tho Blood Centre

Reference: APEC Project No. CTI 30 2016A LSIF: *Closing the Gaps in Good Manufacturing Practices Compliance along the Blood Supply Chain in APEC Economies*

Objectives of Visits

Trip 1 (07 – 12 November 2016)

- Conduct an initial assessment of current practices against the requirements of Good Manufacturing Practice (GMP) to identify gaps in compliance.
- Provide a report of nonconformances to be addressed, with recommendations on corrective actions and prioritisation. (distributed January 2017)
- Provide training in GMP to staff, using the assessment findings as examples.

Trip 2 (09 & 10 November 2017)

- Conduct a follow-up assessment of progress made in addressing the GMP compliance gaps. NOTE: as the length of the visit did not allow a full assessment of all activities or all gaps, the review focussed on the recommendations and priorities from the first report.
- Provide further training on topics nominated by Can Tho that have caused difficulty in either comprehension or implementation.
- Provide a final report on review findings, including any new nonconformances identified.

Summary of Findings from Follow-up Assessment

Overall there have been some good improvements although a number of critical issues still need to be addressed or completed.

A Quality Manager has only recently been appointed. Work has started on GMP (including a Quality Management System) but little progress has been made so far.

The condition of the premises has been improved, particularly in Processing where staff are now required to change before entry and the workflow has been changed to reduce risks of contamination to blood and blood components. However, the flooring should ultimately be replaced. The TTI laboratory has also been improved, and all the issues in the NAT laboratory have been addressed.

Standalone refrigerated component storage facilities have been fitted with second thermometers to improve temperature monitoring, but walk-in facilities still need to be improved. Service and calibration programs have not been implemented for any Collection, Processing or Storage equipment and this should be addressed as a priority - heavy red cell contamination of platelets may be due to poor centrifuge performance.

Several critical process issues have been addressed. New blood bags with sample pouches have been introduced to maintain a closed system of collection, and donor Hb levels are measured using CuSO4 although the results need to be reviewed because of several anomalies. Confirmation of blood grouping has been assured by the implementation of an automated blood grouping system. Tested and untested blood are now well separated.

Critical issues that have not been addressed are traceability, label control and component release. Additionally, the computer system has not been validated. Material storage has been improved but there is no incoming inspection and approval process.

Table 1: Status of Priorities from Trip 1

	Activity	Status
1	Implementation of donor Hb during donor assessment (Centre & Mobile)	Addressed but needs validation due to several anomalous results
2	Change sample collection to ensure system remains closed	Addressed
3	Implement confidential donor assessment with one consistent questionnaire	Addressed
4	Review & improve all component storage facilities including refrigerators, freezers & refrigerated truck (repair, clean, service, calibrate, temperature mapping)	Not addressed
5	Check & remove mould from storage facilities	Addressed
6	Appoint Quality Manager & start to develop & implement quality management system: • Quality Policy • Quality Manual • GMP training for all staff • SOPs – Document Control & Training to be given priority	QM appointed but rest not addressed

NEXT STEPS – discussed at end of review:

- Quality System development
- GMP training
- Calibration & servicing of equipment
- Extend material management to specs & verification of performance
- Address CuSO4 & QC problems
- Flooring in processing
- Component labelling/release
- Hinge on freezer room in laboratories (should plasma be stored in TTI?)

GMP Assessment Follow-up Report

Centre: Can Tho Blood Centre **Dates:** 09 & 10 November 2017

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
Quality Management	• There is no Quality Manager • There is no formal quality management system in place	• A Quality Manager has been appointed – Ms An An • There is still no formal QMS in place	NOTE: • The future focus of the Centre will be to implement ISO 9001 QMS (NIHBT project) • It is critical that Hue does NOT ignore GMP: ✓ Remember that GMP requirements include requirements for QMS ✓ GMP will improve safety as well as quality ✓ GMP requirements are specific for manufacture of blood components
Personnel & Training	• There is no GMP training for staff or contractors eg waste removers	• NO ACTION	
Documentation	• There is no document control system for critical documents & forms eg the donor questionnaire: ✓ There are no unique document identifiers ✓ There are no version numbers ✓ There are no dates effective ✓ Most documents are not formally approved ✓ Many documents including forms are printed onto the reverse side of old documents to save paper & it is not clear which document is the one to use ✓ Some instructions have handwritten amendments &/or additions	• A number of forms are now document controlled	
Records	• Many records are not filled out correctly: ✓ Missing information ✓ Blank spaces ✓ Mistakes corrected by overwriting ✓ Not filled in at the time of checking eg Rh(D) groups all pre-entered as "+" before grouping has been completed ✓ Action not taken for out-of-range results eg	• Record keeping has improved **BUT:** • Equipment does not have unique identification numbers. All equipment is called May 1, May 2, May 3 etc. The only difference is the area that they are located in. This means that the Blood Service has several machines labelled the same, but in different areas. Records do not link equipment to the work	

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	refrigerator & freezer checks • There are no records or inadequate records for critical activities: ✓ Service & maintenance of equipment ✓ Cleaning records (manufacturing areas, work surfaces, storage facilities)	area or the location. • Some records are very poor with little information, eg records for servicing of the apheresis machines which are held by Hospital Engineer • Many changes on records are still not made correctly: ✓ white-out used on several records ✓ other information has been overwritten • Some records are still not filled out correctly: ✓ Entries are incorrect ✓ Acceptable ranges not given (eg temperature ranges) ✓ Actions not recorded if requirements not met (eg temperature too high) • Many records are still not document controlled etc	
Traceability	• There is no traceability of tests to Lot numbers: ✓ ABO & Rh(D) antisera ✓ HBV rapid test strips • Some temperature checking records were not linked to the relevant equipment or the work area • There is no traceability to staff performing critical steps during collection & processing (initials on the blood bag are not records because the bag is sent to the hospital or discarded as expired) • There is no traceability showing which staff member formally released components or checked the release results	• There has been little improvement of traceability to staff, reagents, critical activities etc	
Electronic records/data	• The computer system has not been validated • The computer data is very minimal – eg donor's full date of birth is not recorded on the computer – only the year of birth. This does not allow proper donor identification which should be made using the full date of birth.	• There has been no action on validation, or changes to the computer data	
Buildings & Premises	• Cleaning of work areas has not included thorough cleaning behind & under equipment, in corners etc & dust & dirt are present	• The Logistics storage areas for materials are much cleaner & tidier	

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	• Some areas cannot be thoroughly cleaned because of: ✓ Holes & cracks in floors, walls & ceilings ✓ Exposed wiring ✓ Use of fans, cloth blinds eg in Collection ✓ Keeping windows open eg Collection & refrigerator/freezer room ✓ Joins in vinyl flooring not sealed adequately (holes in floor in exposing wiring) • There is no pest control program • The collection area: ✓ is large & well-lit ✓ has cloth blinds which cannot be cleaned adequately ✓ has reasonable vinyl flooring although some re-sealing of joins is needed ✓ has windows that are opened to cool the room, allowing dust to be blown in ✓ has fans that are also used but which blow any dust around ✓ was hot, but is not monitored for temperature ✓ was dusty in corners • The condition of the NAT laboratory is not GMP compliant: ✓ There is a hole in the vinyl floor which has been repaired but does not allow adequate cleaning ✓ Cleaning has not been carried out behind equipment & there is dust ✓ There are also a lot of loose wiring & electrical cords behind the equipment, which are preventing cleaning ✓ There is an open (unsealed) pipe protruding from the ceiling in one corner, which can drop dirt & dust, & potentially allow entry of vermin or pests ✓ There are cracks in the corner of the wall & the exit for the air-conditioning pipe through the ceiling has not been sealed ✓ The grate (cover) over an air vent in the corner by	• The condition of the Collection area has been improved: ✓ it is much cleaner ✓ the cloth blinds have been removed from windows ✓ windows are now kept closed ✓ it is monitored for temperature ✓ no floor fans are used • The Processing workflow has been improved: ✓ mobile staff do not enter main processing area ✓ centrifuges have been moved to the main processing area • The condition of the Processing work area has been improved: ✓ bench surfaces have been fixed ✓ flooring has been improved as much as possible ✓ the area is much cleaner, including behind equipment • **BUT f**looring still has many cracks & holes that need to be repaired to be GMP compliant • The TTI work area is greatly improved: ✓ It is cleaner ✓ There are no spider webs ✓ Cleaning has been carried out behind equipment • **BUT** there is still an occasional hole in the wall & flooring • The NAT work area has been improved significantly: ✓ Loose wiring has been tied up where possible ✓ Cracks in walls & ceiling have been repaired ✓ Holes have been repaired	

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	the door has not been cleaned of dust ✓ There is a significant hole in the wall next to the door frame	✓ Open unsealed pipe in the ceiling has been closed off ✓ Much cleaner, cleaning has been done behind equipment	
Equipment Management	• Many items of equipment are not regularly cleaned, calibrated or checked: ✓ Sphygmomanometer ✓ Donor scales ✓ Hemomix (automatic blood mixers) ✓ Kitchen scales used in Processing ✓ Thermometers ✓ Heat sealer	• There is still no regular calibration or servicing of equipment • Regular performance checks are still not performed • Equipment that is not being used is not clearly marked “Do not use” (eg rapid freezer in Processing)	
Component Storage Equipment	• The general state & cleanliness of the component storage equipment (refrigerators, freezers, walk in cool rooms & freezer rooms) are not acceptable: ✓ Upright freezers are badly iced up, with ice over & around the components ✓ The Processing cold room has rusted patches on floor, & pools of water on the floor from water dripping (leakage or excessive condensation) ✓ The Processing cold room appears to have some mould growing in the dampest places ✓ The Processing cold room holds blood stacked on upturned polystyrene boxes which prevent cleaning ✓ Exposed wiring is hanging from the ceiling of the Processing cold room ✓ Plasma is stored in numerous sealed polystyrene boxes in the Processing freezer room which are placed on the floor, preventing cleaning. The boxes date back to 2015. ✓ The Processing freezer room also contains plastic & cardboard debris in several areas next to boxes of coolants (ice bricks) ✓ The flooring in the Storage cold room is heavily scratched & is not clean ✓ The Storage cold room ceiling has large drops of water at the edges showing excessive	• Stand-alone refrigerated storage facilities now have a lagged probe for the 2nd temperature check • Cleaning is performed regularly **BUT:** • Alarm checks are not carried out • The freezer room in TTI laboratories holds plasma for fractionation but the bottom door hinge is broken so there is no assurance the door closes properly • The flooring is rusted in some of the walk-in facilities eg the cold room for untested red cells • The temperatures in the quarantine freezer room are too low for the storage of plasma – the records show that the temperature ranges from -11^{o}C to -25^{o}C • The freezer room for tested plasma is iced up at the door way & water is dripping from the ceiling inside, forming a tall icicle • There are many boxes of plasma sitting on the floor of the walk-in freezer. This prevents good cleaning of the floors. • There are also many crates of red cells sitting directly on the floor of the cold room or on top of polystyrene boxes, preventing good cleaning • There is no regular calibration or servicing of storage equipment	

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	condensation or leakage ✓ The Storage cold room walls have rusted marks showing that the drops of water have been running down them ✓ The Storage freezer room contains numerous boxes of plasma that sit directly on the floor, preventing adequate cleaning ✓ The blood storage refrigerator in Storage/Distribution has damaged, chipped & rusted drawers that cannot be cleaned • There is no evidence to show that the component storage equipment is functioning correctly & accurately: ✓ Chart recorders are in place on some equipment but are not used ✓ Equipment does not all have two independent temperature probes that enable temperatures to be compared & confirmed ✓ Not all equipment has a temperature display that gives a reading to one decimal point, therefore the accuracy of the temperature cannot be assured ✓ The temperature monitor for the Processing cold room, which does not read to one decimal point, is also set high above the door where it cannot be read accurately ✓ Temperature probes are not lagged in water & therefore only read air temperatures which are not representative of the temperature of components ✓ Temperature mapping has not been carried out & the cold/warm storage spots are not identified ✓ Alarm checks are not performed ✓ Some door seals appear to be damaged & do not maintain a good seal when the doors are closed • No action has been recorded for several refrigerator readings that are out of range • No action has been recorded where two independent temperature probes have given readings that are significantly different from each other (up to 1.4^{o}C difference for refrigerator, up to 7.6^{o}C for freezer) • The records for the quarantine platelet rocker in		

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	Processing show second readings from 07/11/16 onwards that are >24ºC but no action was taken (the record stated the acceptable range as 20 – 24ºC)		
Material Management	• There is no incoming inspection of the goods against the specification or any formal approval for use • There are no designated areas for Quarantine and Reject goods • There is no traceability to receipt of goods including different deliveries of the same Lot Numbers • Storage areas for material are not tidy, regularly checked or cleaned: ✓ The boxes of blood bags in the blood bag storage room are placed directly on the floor or on dirty sheets of cardboard, or on plastic pallets, preventing cleaning ✓ There is evidence of a possible leak into the ceiling that has caused part of the ceiling to fall away ✓ There is also evidence of water damage near the floor along one wall, & potential growth of mould • Storage areas also contain other items for the hospital like bottle brushes, blood lancets etc • Reagents are not dated or signed when opened or when prepared: ✓ ABO & Rh(D) grouping antisera ✓ Blood bags (aluminium foil packets – 15 day expiry) • Storage of TTI reagents in the laboratory is not satisfactory & there is no assurance that they are stored at the correct temperatures: ✓ The forms used for temperature checks are not document controlled or linked to the storage facility & there are many empty fields that have not been filled in ✓ A second independent temperature check is not performed ✓ Servicing & calibration has not been performed ✓ No alarm checks are performed, & some facilities do not have alarms ✓ Only 2 refrigerators have probes placed in	• Material storage areas (Logistics) are much neater & tidier • Temperature monitoring is in place • Goods are stored off the floor, allowing easy cleaning • Boxes are stamped after inspection to show that they have been inspected • There is a designated quarantine area • Some reagents are dated on opening, but not all of them **BUT:** • Foil packets holding blood bags are still not dated & signed when they are opened (2 types of bags, 2 different expiry dates) • Some reagents are not clearly labelled with contents, date of opening/decanting & signature • Other empty containers such as empty hand soap containers are washed & re-used for reagents. There is no assurance that this does not affect the efficacy of the reagents (Collection)	STORAGE ROOM IN THE COLLECTION AREA: • This storage room is not clean or tidy • The temperature is not monitored when the air-conditioning is switched off & there is no evidence that the storage requirements for the goods in the store room are met • There are many large & small containers of reagents/disinfectants for use in Collection or on Mobiles: ✓ Some of these are not labelled clearly with contents, date of preparation & signature of staff preparing them ✓ Recycled containers are used but there is no assurance that the washing of the containers is acceptable

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	containers which are unlabelled, undated & dirty. 1 container is empty, the other has a volume of unknown liquid in it ✓ The refrigerator shelves are not clean & there is considerable rust & damage to the surfaces, preventing adequate cleaning ✓ There is also rust on some of the external surfaces which has not been cleaned off ✓ The digital display on one refrigerator was reading 8.2ºC but no action had been taken ✓ One refrigerator had evidence of moisture between the 2 glass door panels, indicating damaged seals		
Label Control	• There is no control of critical labels (barcoded donation numbers, "Tested" labels, component labels, pooling labels) • All barcoded donation numbers on a sheet of labels should be accounted for: ✓ Number used ✓ Number left ✓ Number discarded	• Barcoded donation numbers are still not controlled	
Collection *(see also comments under Mobiles)*	• The donor questionnaires used at the Blood Centre & on mobiles are different. The questionnaire used at the Blood Centre is the previous (old) version which does not have the Zika questions on it. The reason given was "to use the old copies up". The risks of doing this have not been assessed. • Donor assessment is not satisfactory: ✓ There is an interview room but it is not used to provide confidentiality for the medical & risk assessment ✓ Donor Hb is not measured ✓ The weight at time of donation is not measured for all donors. Donors can tell the staff their weight, with no assurance that it is the correct weight on that day • Several errors have been made in the entry of critical donor data eg errors were made in the entries of the CMD number & the DT number of donor Nguyen Thi	• The condition of the Collection area has been improved: ✓ it is much cleaner ✓ the cloth blinds have been removed from windows & windows are now kept closed ✓ it is monitored for temperature & floor fans are no longer used • The Hemomix scales are now clean and there are no remnants of labels attached • The donor Questionnaires used on Mobiles & at the Centre are now identical • Donor identification has improved: ✓ the identity card details written down by the donor (Số CMND) are checked by staff against the donor's ID card **BUT** it is not clear if the identity of the donor is checked against the donor's form at each critical point	• Donor assessment is carried out by the Technician not the Doctor. Training records for this critical role were not reviewed • The container of CuSO4 was not labelled with the contents, date of preparation or staff signature • The Hb results from the CuSO4 test were not clear: ✓ The blood drop is taken from the end of a syringe & is therefore a very large drop compared to a drop from a capillary tube ✓ One donor's drop sank to the bottom of the container but then rose again to near the top ✓ A repeat Hb test showed the same sinking to the bottom then rising to the top ✓ Despite this unclear result, the donor was

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	Kim Phuong, year of birth 1970, between his donations in 2009 & in 2016 • The donor's full date of birth is not recorded on the computer – only the year of birth. Donor's identification should be made using the full date of birth. • Positive identification of the donor against questionnaire is not always performed • One single workstation between donor couches is used simultaneously for 2 donors, increasing the risk of mix-ups between donors (paperwork, labels) • The Hemomix automatic scales are not clean – there are remnants of labels & adhesive stuck to them • The Hemomix scales measure the duration of the donation but this time is not recorded • The sample collection method is unacceptable as it does not maintain the closed blood bag collection system & the integrity of the sample is not assured (see comment under Mobile) • The use of barcoded donation numbers is not controlled: ✓ Sets of spare labels are kept on the desk in the reception area which is often left unattended ✓ Blood bags are not labelled at the donor bedside – they are removed to another workbench for labelling ✓ There is no reconciliation of numbers used & not used • The work bench where the bags are labelled & heat sealed is not clean & there are considerable remnants of adhesive which prevents adequate cleaning • A number of bottles of reagents are not labelled, or not initialled & dated when prepared, opened or filled. • Records of donations collected are not document controlled but are hand written into a book • There is no traceability to lot numbers of reagents, staff or critical activities	• Donor confidentiality is maintained – the donor is assessed in a separate interview room • Donor haemoglobin is now assessed by CuSO4 • Sample collection has been significantly improved by use of new bags with sample pouches • There is still one workstation between donors, but only one donor is bled at a time, reducing the risk of mix-ups • Labelling of bags is completed at the donor bedside **BUT** there is still no reconciliation of used & unused labels • Donation start & finish times are written on donation bag (recording of duration of donation) • Donations are placed straight into a cool box until taken to Processing • The temperature in the cool box is monitored but not recorded eg at the time of despatch to Processing **BUT:** • The foil packets containing blood bags are not dated & signed when they are opened • Records for servicing of the apheresis machines are held by Hospital Engineer & are very poor with little information	still allowed to donate • The CuSO4 solution should be checked & qualified. • The work area for carrying out the Hb & rapid HBV tests did not have a good workflow even though the room is big enough: ✓ There was no seat with an arm for the donor to sit on during collection of the sample ✓ The testing was performed too close to the donor & next to the sink which was also used for hand washing • The start & finish of the donation was written on the collection bag, not the actual donation time. The donation time is measured by the Hemomix & it would be easy to write it onto the bag for accuracy • There is no permanent record of the donation time – the record of the time is lost when the component is sent to a hospital, or when it expires • Stripping of the collection line is performed only once using forceps not strippers – this should be reviewed as many of the tubing segments used in Processing for blood grouping contain large clots • The Storeroom used for tubes & bags: ✓ Is not cleaned regularly ✓ Is not monitored for temperature when the air cooling is switched off
Mobile	• Venue used does not meet GMP requirements: ✓ Wooden desks used for ABO & Rh(D) grouping &	NOT VISITED	

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	rapid HBV screening – not clean ✓ Not clean ✓ No monitoring of temperature where donations & materials are located (very warm) ✓ Waste is not handled appropriately & there were many blood-stained cotton wool swabs on the floor • Equipment is not managed appropriately: ✓ The chairs used in place of donor couches cannot be cleaned because of rust ✓ Kitchen scales are used to weigh the donation but are not adequately checked & are handled roughly when mixing the donation prior to sample collection ✓ The scales did not appear to be clean • The single work surfaces between donor chairs are small: ✓ The stainless-steel trays are not all adequately clean ✓ The sharing of one surface for 2 donors increases the risk of mix-ups between paperwork, tubes, bags, labels ✓ Kitchen scales are placed either on the floor or on a cardboard blood bag box which cannot be cleaned satisfactorily • Reagents (disinfectants) are not all clearly labelled with the name of the reagent & the date opened or filled. • Donor questionnaires are not completed or handled properly: ✓ The questions in Section II & the second part of Section III are filled out by local Volunteers before the donors arrive ✓ Some donors did not answer the questions in the first part of Section III & several other fields were left blank ✓ In some cases, the questionnaire was placed under the arm below the venepuncture site • Donor identification was not always performed correctly & some questionnaires did not record the donor's CMD number as required for initial identification		

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	• Donor assessments are not carried out adequately: ✓ There is no confidential assessment & a donor with a reactive rapid HBV screen was told of the result in front of a group of other donors ✓ Hb is not measured on any of the donors ✓ Fingerpicks are carried out over handwritten records in log book • Documentation is not controlled: ✓ The donor questionnaire ✓ Rapid HBV screens are manually recorded in a book with no headers or traceability • Processes for cleaning the venepuncture site, labelling tubes & blood bags, & handling the donor's paperwork are not consistent between the different staff • Strips of tape for holding the needle & tubing in place are stuck to the rusty chairs waiting to be used, & are therefore not clean • The blood bags were not always placed on clean surfaces during collection - some were placed directly on the dirty floor • Not all bags were adequately mixed during collection • The sample collection method is unacceptable as it does not maintain the closed blood bag collection system or the sample quality: ✓ The sample is collected by removing the needle from the donor's arm, mixing the bag & then expressing blood from the bag into the sample tubes through the needle. This method breaches the integrity of the bag by opening the system to contamination ✓ The needle is then recapped ✓ Sample quality cannot be assured as they will consist of a mix of undiluted blood from the tubing & diluted blood from the pack (diluted by anticoagulant) • There were delays in stripping the tubing of some donations • The use of barcoded donation numbers was not		

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	controlled: ✓ There were delays in completing the labelling of the bags & tubes, & in one case, the donor had already left the chair & the next donor had sat down ✓ Some bags were not labelled at all until the donation was completed ✓ Unused labels were removed from the sheet after the donation was completed & stuck onto the work table. These were then used to wrap around the recapped needle of another donation. This meant that these donations had 2 different donation numbers attached. • The handwritten information written on bags was inconsistent: • The date of collection was written in the wrong place on some bags eg in the "Rh" field • The signature of the staff member was written in different places • Some bags had the time of "needle in" written on it while others did not • The temperature of whole blood donations is not monitored during packing & transport back to the Centre • Computer records are available but have only basic information & only record the donor's year of birth, not the full date of birth • The work flow should be improved: ✓ The venue is a large area & the arrangement of reception, screening, collection & refreshment could be spread out further to allow more space between the stations. At present, the stations are close together & there are numerous donors waiting in each area. This reduces any confidentiality between donors, & increases the risk of accidents & errors.		
Processing	• The centrifuge room opens directly out into the mobile parking area, allowing heat & dust to enter every time the door is opened. • Transport boxes containing donations & samples from	• The Processing workflow has been improved: ✓ mobile staff do not enter main processing area ✓ centrifuges now in main processing area • The condition of the Processing work area has been	• Many of the tubing segments for grouping have clots in them – this needs to be investigated • Many platelets have red cell contamination - ?

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	mobile are delivered to this door & carried through the centrifuge room into the next room where heat sealing takes place. This workflow allows dirt to be tracked through the centrifuge area • Gown, hair cover, gloves & shoe requirements for entering the department are not consistent. Staff & visitors are required to change shoes & put on gowns but mobile staff who are delivering & heat sealing the collected blood can enter Processing without wearing gowns, masks etc • Bench surfaces are in very poor condition with many scratches & other damage which is preventing adequate cleaning • Flooring is not clean & there are many cracks & holes • There is dust behind the centrifuges • There are no Processing rules applied to donations before centrifugation: ✓ Transport temperatures & times ✓ Maximum duration of donation time to ensure FFP will be acceptable quality (also important for whole blood platelets) ✓ Check of time since donation for each bag to ensure acceptable quality of FFP (donations from late mobiles are stored overnight in checking area) • Some bags had brown tape placed on the edges of the donation barcode label, possibly to hold the number in place. This was not identified & reported as a non-conformance. • Blood bags are not always placed on clean surfaces • There was no evidence to show that the equipment had been cleaned or checked: ✓ No records for checking of the kitchen scales used for balancing centrifuge buckets ✓ The heat sealers were not clean ✓ The plasma presses are chipped & not clean • Centrifuge buckets were balanced using pieces of plastic & unused bags that were not regularly cleaned • The lists of centrifuge programs had been signed but	improved: ✓ bench surfaces have been fixed ✓ flooring has been improved as much as possible ✓ the area is much cleaner, including behind equipment • **BUT** the flooring still has many cracks & holes that need to be repaired to be GMP compliant • The time of the donation is not checked before platelets are made • There have been 2 small changes to the blood grouping process on tubing segments: ✓ the process is better controlled by doing one test at a time ✓ there is traceability to the 2 staff members but not to the reagent Lot numbers • **BUT** the grouping is still only ABO grouping & the results are not recorded • Centrifuges are regularly cleaned **but** have not been regularly service & calibrated • Plasma presses have been cleaned **but** are still rusted & need recoating • The rapid freezer is broken but is not clearly marked “Do not use”	centrifuge failures •

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	there was no date • One of the lists was taped to each of the tops of the centrifuges preventing the surfaces from being adequately cleaned • Expiry dates are stamped into the incorrect place on some pack labels • Blood group confirmation is performed in Processing on a segment taken from each red cell bag: ✓ The grouping is a red cell ABO group only ✓ The glass tile is not labelled with the segment identification ✓ The results are not recorded & there is no traceability to staff or reagents • Processing is notified of TTI reactives: ✓ There is no traceability to staff removing the reactive components ✓ Platelets are marked eg "HBV +" but are left in the Quarantine platelet rocker • There are multiple automated cell separators (Compomat, Giotto) that are not in use (Comment only)		
Mandatory Testing *ABO & Rh(D) Grouping, TTI screening & NAT*	• The form used to list samples sent to the mandatory screening laboratories is not document controlled & was not completed correctly • The sample quality & integrity cannot be assured because of the unsatisfactory collection technique • The instructions for grouping are not document controlled, there is no date effective & they have hand written notes on them • There are many cobwebs in gaps in the wall of the sample reception area • Grouping reagents are not managed appropriately: ✓ Not dated & initialled on opening ✓ Some reagent red cells are not correctly labelled with contents eg reagent red cells used for antibody screening are placed into recycled NANOLYS bottles which are dated, but are not relabelled with the contents • At the end of incubation, the grouping microtitre plates	• The TTI work area is greatly improved: ✓ Cleaner ✓ No spider webs ✓ Cleaning has been carried out behind equipment • **BUT** there is still an occasional hole in the floor or wall • Waste liquid is decontaminated before it is discarded down the sink • There are temperature checks & cleaning records for reagent refrigerators • Traceability has been improved: ✓ staff carrying out tasks sign worksheet – but can be improved with use of a stamp ✓ worksheets are now linked to Lot numbers ✓ new Lot numbers are identified & clearly marked	• The new Qwalys equipment was not qualified & validated before use • 3 samples are pooled for antibody screening – this is a deviation from the manufacturer's instructions & has not been validated • The pooling process is not closely checked against pre-printed worksheet

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	are centrifuged for I minute & then agitated for 1 minute. The agitation is not timed & is very variable – some plates were agitated for much longer than the required 1 minute. • Rh(D) blood group results are not entered in real time. The computer work sheet has all the Rh(D) results already entered as "+" – the result is changed if the sample is negative "-" • There is no traceability of the grouping process to reagents or staff • Waste liquid is not decontaminated before disposal & is poured down the sink with minimal water to flush it properly • The process for verifying results before electronic transfer to computer is not traceable & does not involve clear & consistent approval of the transfer • TTI worksheets printed out by the Diasorin equipment are pasted into a log book that is not document controlled • The worksheets are not linked to reagent/kit Lot numbers • Results are recorded on forms that are not document controlled • The temperature & humidity monitor in the laboratory with the Cobas e601 machines was reading 27^{o}C & 72% respectively. It was not clear if these readings were acceptable for the equipment & the testing performed there. • The monitor was also placed on a window sill furthest from the external windows & machines & it was not clear if this area was representative of the rest of the room • The method of storing archive samples for the mandatory period of 2 years has not been validated to show it is acceptable & that retesting will give reliable, valid results	in materials record • **BUT** the DiaSorin machines are not labelled eg "May 1" • Temperatures in the laboratory are outside the range on the monitoring forms – need to include limits for machine operation as well as target range for room • The temperature monitor should be closer to the equipment • New Lot numbers are not verified for acceptable performance before use NAT: • Premises have been improved significantly: ✓ Loose wiring has been tied up where possible ✓ Cracks in walls & ceiling have been repaired ✓ Holes have been repaired ✓ Open unsealed pipe in the ceiling has been closed off ✓ Much cleaner, cleaning has been done behind equipment • There are service reports from Roche **BUT** they need more detail on activities performed BLOOD GROUPING: • The grouping process has been significantly improved by use of the Qwalys instrument • Antibody screening is also carried out using the Qwalys • Reagents are dated when opened	
Component Storage & Handling	• The cold storage truck that brings blood back to the centre from the mobiles is not cleaned regularly • The temperature probe is right under the fan & it cannot	• Storage areas/facilities for quarantine (untested) components are now separated from tested components	•

GMP Section	Observations (07 – 12/11/16)	Progress Assessment (09 & 10/11/17)	New Observations (09 & 10/11/17)
	be assured that the temperature is representative of the rest of the truck where the blood is placed for transport • There are no records of the temperature at the time blood is placed into the truck or when it arrives at Can Tho Centre • Platelets are not placed correctly into the rockers. They are stacked on top of each other, preventing good air circulation	• Probes are in lagged containers for the 2nd check • Cleaning is now carried out behind equipment • **BUT** there are still no regular alarm checks on refrigerators or freezers	
Component Release	• The "released" label does not have any statement on it re HIV etc. This is inconsistent with other Centres • The release labels are printed in blocks, increasing the risk of placing the wrong label on the wrong component • The process relies heavily on human checks to ensure the release is performed correctly • There is no traceability to staff performing release, applying the labels or checking • The form recording the donation numbers during release only has the ABO group & not the Rh(D) group • The release label for pooled cryoprecipitate is not placed onto the component, but on the plastic bag into which the component is placed • The printed identification barcode numbers used for pooled components are taken from sheets that are not controlled or secured adequately	• There have been no improvements to the component release process or labels • Two staff check all results **but** there are still many possible points for failure	• Blood groups of regular donors are not checked against previous result until later, often only after component release DISTRIBUTION: • The security to the area could be improved • There is a platelet rocker for tested/released platelets: ✓ platelets are not labelled with a release label ✓ the rocker had expired platelets on it ✓ one platelet showed signs of significant red cell contamination ✓ the platelet rocker alarm for battery was sounding but was ignored
Process Control/QC	• Quality Control testing is only performed on platelets: ✓ Visual red cells ✓ Platelet count • Many of the platelets appeared to have red cell contamination but counts are not performed as part of QC • No action is taken if the platelet counts are below the acceptable limits & the results are not tracked for trends etc	• QC testing now includes red cells but not FFP • Red cell contamination of platelets should be included as a priority because so many platelets look as though they have too many red cells in them	• Investigation of failed results must be documented RECOMMENDATION: • Test platelets individually, NOT as pools of 3

NEXT STEPS – discussed at end of review

- Quality System development

- GMP training
- Calibration & servicing of equipment
- Extend material management to specs & verification of performance
- Address CuSO4 & QC problems
- Flooring in processing
- Component labelling/release
- Hinge on freezer room in laboratories (should plasma be stored in TTI?)

GMP Assessment Follow-up Report

Cho Ray Hospital, Ho Chi Minh City

Reference: APEC Project No. CTI 30 2016A LSIF: *Closing the Gaps in Good Manufacturing Practices Compliance along the Blood Supply Chain in APEC Economies*

Objectives of Visits

Trip 1 (21 – 26 November 2016)

- Conduct an initial assessment of current practices against the requirements of Good Manufacturing Practice (GMP) to identify gaps in compliance.
- Provide a report of nonconformances to be addressed, with recommendations on corrective actions and prioritisation. (distributed January 2017)
- Provide training in GMP to staff, using the assessment findings as examples.

Trip 2 (16 -18 November 2017)

- Conduct a follow-up assessment of progress made in addressing the GMP compliance gaps. NOTE: as the length of the visit did not allow a full assessment of all activities or all gaps, the review focussed on the recommendations and priorities from the first report.
- Provide further training on topics nominated by Cho Ray that have caused difficulty in either comprehension or implementation.
- Provide a final report on review findings, including any new nonconformances identified.

Summary of Findings from Follow-up Assessment

Overall the level of progress has been very good and most of the critical activities have been addressed.

There have been very good improvements in many areas. There is a good internal audit program in place under the Quality Management System and a Change Control process has been developed but not yet implemented.

Premises have been improved in Processing and the Testing laboratories which both now have change rooms to ensure staff and visitors wear protective clothing when entering the work areas. The Processing area has also been fitted with new benches and the level of cleaning is now good. The apheresis area has been enlarged to make more room, but has otherwise not improved. It was very dusty and dirty, and gaps in the flooring where a wall had been removed, had not been sealed. Pipes were also exposed, creating a high risk of contamination of components.

Management of materials has improved and there is a clearly marked quarantine area for blood bags waiting for inspection. Pre-acceptance verification of new Lot Numbers of test reagents is now carried out by the TTI laboratories.

Monitoring and calibration of most equipment is now being performed but some of the records need to include more details on the processes, particularly the calibration process. Component storage equipment is cleaned and checked regularly by an external contractor, however alarm checks are not performed and there was no information on the alarm set points. Storage ranges for some facilities appeared to be higher than internationally accepted standards for the components stored in them. The walk-in freezer rooms, which were critically non-compliant at the first visit have been tidied, cleaned, and the load of plasma stored reduced significantly to allow entry of staff and adequate cleaning.

The performance of the computer system is being regularly verified but needs to include verification that backed-up data can be restored without loss or corruption.

The most significant process improvement has been the introduction of blood bags with sample collection pouches, which now maintains a closed system that reduces contamination risks. The printing of barcoded

donation numbers is well controlled, but the labels are still not adequately controlled at point of use. The confirmation of blood groups is now good. Component release now requires a check of groups and red cell antibodies at labelling, but the check is only manual and has the risk of errors. Platelet release still occurs in the Apheresis work area.

There are still a number of issues at mobile venues, and these are listed in the following report.

Table 1: Status of Priorities from Trip 1

	Activity	**Status**
1	Release labelling procedure (dedicated release area, check of ALL TTI & ABO Rh(D) results for each component before release labelling)	Partly addressed
2	Risk of contamination to blood bags at mobiles (sample collection technique) & during transport	Addressed
3	ABO Rh(D) confirmation	Addressed
4	Separation of quarantine vs released vs reject components	Addressed
5	Review of Processing & Storage workflows	Mostly addressed – rapid freezing of FFP should be performed in Processing to avoid over-handling of the FFP
6	Facility improvement & cleaning	Partly addressed (Processing and Testing)

GMP Assessment Follow-up Report

Centre: Cho Ray Hospital, Ho Chi Minh City **Dates:** 16 -18 November 2017

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
Quality Management	• Some good quality systems are in place eg document control • No formal change control system in place • Comparison of performance on different TTI assays has been performed, but no formal Validation & Qualification system in place • There are some conflicting responsibilities – the Quality Manager is responsible for implementation of quality system AND for performing QC testing	• There is a good internal audit system: ✓ the schedule is planned for 12 months ✓ there are reports\responses with evidence & close outs ✓ the reference Standards are ISO 15189 & MOH Standard • The Change control SOP has been written but not yet implemented • Formal Management/Product Review has not yet been established	• There is too much reliance on one person to do QM activities & manage QC
Personnel & Training	• No GMP training for contractors eg waste removers, volunteers at Mobiles	• There are training plans, materials & assessments in place for contractors **BUT** GMP principles are not included	• Training needs to include GMP requirements built into each training program
Documentation	• Not all documents are document controlled: ✓ some MCS+ records ✓ component records ✓ reference sheet taped up on wall in Processing, showing target weights for different types of blood bags • NOTE: where the documents are document controlled, the system is very good.	• There are still some forms that have not been document controlled	
Records	• Some records are not filled out correctly: ✓ Missing information eg donor questionnaires ✓ Blank spaces ✓ Missing signatures ✓ Name stamp used instead of actual signature ✓ Mistakes corrected by overwriting ✓ Information recorded in the margin at the bottom of the record with no explanation • Incomplete external records:	• Donors remove their own forms from the bedside after donation but there is no reconciliation to confirm that all forms are handed back in • The standard of record keeping was very good, with only an occasional change made incorrectly by overwriting • Not all out-of-specification results had action or comments recorded against them	

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
	✓ Some maintenance records show the results of activities for multiple equipment on one record ✓ The records do not provide enough detail on the checks/service performed, the results & the conclusion eg the centrifuge records in Processing		
Traceability	• There is no traceability of tests to Lot numbers, or the staff member performing the test: ✓ ABO & Rh(D) antisera ✓ TTI rapid test strips	• Still needs to be addressed	
Electronic records/data	• The computer system has not been validated	• Printing of barcodes is now well controlled • There is a Plan for regular backups of the computer system • Records are available to show that backups have been done • The transfer of critical data is regularly checked & recorded as verification of performance eg upload of TTI results	• There should be regular verification that backed up data can be restored (at least once a year or when technology changes)
Buildings & Premises	• Premises are not GMP compliant for cleanliness & general condition: ✓ Damage to walls ✓ Floor tiles used in some areas eg Grouping ✓ Use of window blinds ✓ There are plants in some areas ✓ There are unclean areas behind equipment ✓ Boxes on floors & loose wiring etc prevents adequate cleaning ✓ Some work surfaces, including donor couches, are covered with sheets of material which cannot be cleaned easily ✓ Wood is used in several work areas – the desk in apheresis used for release, cupboards under work benches & other surfaces in TTI • No pest control program in place • Security is not consistent - some areas are locked, but external waste removal staff are allowed unsupervised into manufacturing areas to collect waste	• The apheresis area has been enlarged but is not GMP compliant: ✓ the flooring has not been adequately sealed where a wall was removed to enlarge the area & it was very dusty & dirty ✓ there are holes in walls ✓ the ceiling panel above the platelet rocker is lifting ✓ cloth blinds are still used (heat is a problem) ✓ there are exposed, dirty pipes in the new section • The Processing area has been improved: ✓ There is a separate change room & everyone entering must change into protective clothing ✓ The workflow is much better ✓ The work area is monitored for temperature	

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
	• There are no change rooms before entry into Processing • The workflows do not protect components: ✓ Storage & freezing facilities in Processing & in Storage ✓ Components move backwards & forwards between floors for release labelling etc. ✓ Frozen plasma stored in freezer room in TTI laboratory ✓ Not all areas are monitored for temperature		
Environmental monitoring	• Not all areas are monitored for temperature or humidity eg material storage areas	• Environmental monitoring has improved but should be reviewed for: ✓ Location of the monitor/thermometer – they should be located where the temperature is critical eg close to the platelets in apheresis (one rocker is not in a controlled cabinet), or close to laboratory machines ✓ Temperature ranges	
Equipment Management	• Equipment is not regularly cleaned: ✓ the heat sealer on Mobile was very dirty with some rust ✓ the plasma press in processing was also dirty & rusted • Many items of equipment are not regularly calibrated or checked: ✓ Sphygmomanometer ✓ Donor scales ✓ Kitchen scales used on Mobiles ✓ Thermometers	• Monitoring of equipment has improved • Calibration programs are in place • There are records of servicing etc **BUT** they need more detail about the work performed & staff signatures to show that the records have been reviewed • Action was not always taken when equipment performed out of specification or was alarming eg the platelet rocker in apheresis which was alarming as “no battery”. Any alarm or out of range reading should have an action or comment recorded against the result	
Component Storage Equipment	• The refrigerated truck for transport of donations from Mobiles to the Cho Ray Centre was dirty: ✓ There were sheets of ragged cardboard along the wall ✓ There were 2 spare tyres lying on the side ✓ The flooring was chipped ✓ There were bits of cardboard & old polystyrene	• Security to the component storage areas, rooms & most of the refrigerators & freezers is good BUT one refrigerator could not be locked & was protected by a length of signed tape across the door to show if the refrigerator had been opened out of hours • TTI reactive items are stored in refrigerators in the “Tested” room, but the bag labels are crossed	

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
	sample racks • The correct temperature for maintaining the quality of the donations during transport could not be assured: ✓ The temperature probe was hanging in air under the fan & therefore did not represent the temperature where the donations were placed for transport ✓ There were no records of temperature at the start & end of each transport run • Component storage equipment (refrigerators, freezers, walk in cool rooms & freezer rooms) are not cleaned regularly: ✓ Waste items (plasma clips, donation labels) & dust are present ✓ There has been a leakage of foam-like material from the ceiling in the Storage Cold Room ✓ There is evidence of an old dried spill of blood or plasma on the floor ✓ There are patches of rust on the floors of the walk-in facilities ✓ The freezer rooms for tested plasma could not be accessed at all for cleaning because of the volume of plasma stacked inside ✓ Upright freezers have some ice over the condenser & door, & chest freezers have ice around the sides ✓ Several freezer rooms are badly iced up, with ice over & around the components • There is no evidence to show that the component storage equipment is functioning correctly & accurately: ✓ Chart recorders are in place on some equipment but are not used, eg platelet rockers ✓ Not all equipment has two independent temperature probes that enable temperatures to be compared & confirmed ✓ Some equipment has a second display outside the building which should be checked & recorded ✓ Not all equipment has a temperature display that gives a reading to one decimal point, therefore the	through which prevents the donations from being used in error • A stainless-steel box was also stored in the refrigerator that holds the TTI reactives – it was said to belong to the external engineer • There are records from the external contractor for regular cleaning & checks of the refrigerators **BUT**: ✓ Records of alarm checks do not give the expected set point temperatures of the alarms or the temperature readings when the alarm was activated ✓ Cleaning records do not specify the cleaning solutions used (which should be approved by the QM) ✓ Some records show out of specification readings but no comment or action has been taken or recorded ✓ Temperature ranges for RC storage are given as 2 - 8^{o}C not 2 - 6^{o}C (international Standards) ✓ Alarms are said to be set at 2 & 8^{o}C. Alarm set points should be set <u>inside</u> the acceptable temperature range for storage of components eg acceptable storage range for RC should be 2-6^{o}C, so alarms should be set at 3 & 5^{o}C ✓ The refrigerators were reading high for WB & RC ✓ Several freezers were reading too warm for FFP • The walk-in freezer rooms have been significantly improved: ✓ They are much cleaner ✓ The volume of plasma has been reduced to a level that allows good air circulation & cleaning	

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
	accuracy of the temperature cannot be assured ✓ Temperature probes are not lagged in water & therefore only read air temperatures which are not representative of the temperature of components ✓ Some of the temperature probes are placed on the ceiling near the fans. There is no evidence to show that this place is representative of the temperature around the blood itself ✓ Temperature mapping has not been carried out & the cold/warm storage spots are not identified ✓ Alarms are set to sound only after a long delay. This prevents them from sounding too often (probes measuring air) but this is not acceptable. ✓ Alarms are not checked to ensure they are activated at the right temperatures & under the correct conditions (out-of-specification, power off etc) ✓ One ultra-low upright freezer in Storage has an expected range of -55ºC to -60ºC but the readings on 23 November showed that the temperature had risen from -50ºC at the first check to -15ºC at the second check 4 hours later. The first reading on 24 November showed the temperature had only dropped to -24ºC. No action had been taken despite this suggesting performance problems ✓ Another upright freezer has an expected range of -25ºC to -30ºC but temperature checks showed that the temperature had ranged from -21.9ºC to -19ºC over the last 2 days. No action had been taken despite this suggesting performance problems • Additionally, for Cold Rooms No. 4 & No. 2: ✓ One temperature display does not give a reading to one decimal point & is set above the door where it is too high for staff to read accurately ✓ There is a second display, also above the door, that does give readings to one decimal point ✓ The two displays read approximately 2ºC & 6.6ºC for Cold Room No. 4 & approximately 9ºC & 5.3ºC for Cold Room No. 2. These levels of differences are unacceptable, with 9ºC & 6.6ºC outside the		

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
	acceptable range for blood storage. No alarms were sounding & no action had been taken. • Action is not always taken when temperature readings are out of specification • FFP & frozen plasma stored in large volumes in bags stacked on floor in freezer rooms – access is difficult & the significant amount of ice potentially impairs freezer performance		
Material Management	• Storage areas not regularly cleaned eg reagent cool rooms have sheets of dirty cardboard & rust patches on the floors • Some materials: ✓ not monitored for temperature eg on mobiles ✓ stored directly on floor (cannot clean under) ✓ stored in laboratories or work areas without good monitoring • There is no traceability to receipt of goods including different deliveries of the same Lot Numbers • No formal incoming inspection or approval for use • No process or designated areas for quarantine of reject/recall materials • Many of the materials have not been qualified eg the use of Presept effervescent tablets for decontaminating waste on mobiles has not been validated • Some reagents that are in use are not labelled with contents eg the small plastic cups of CuSO4 • There were 2 large 5L containers with Cobas TaqScreen wash reagent labels on the front. They were clearly being used for some other reagent, but it was not clear what that reagent was. • Reagents are not dated or signed when opened or when prepared: ✓ ABO & Rh(D) grouping antisera ✓ Blood bags (aluminium foil packets – 15 day expiry)	BLOOD BAG STORAGE: • There is now a process & records for inspection, QC & release • Released cartons are separated from unreleased by flimsy barriers that can be moved easily (this was fixed later) • Individual cartons are not traceable to a delivery date so that different shipments of the same Lot number can be identified • Suggest that: ✓ squares are painted on the floor to show the quarantine/release areas (done – red & black squares) ✓ cartons are stamped, dated & signed to improve traceability • **BUT** goods need to be off floor to allow easy cleaning & SOP needs to define which colour square is “quarantine” & which is “released” SAMPLE TUBE STORAGE: • The storage area is now regularly monitored for temperature	
Label Control	• Procedural control is needed to prevent barcodes being printed twice	• Computer printing of barcodes is now well controlled	

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
	• Ranges printed & issued, including date & person printing should be traceable • No reconciliation of labels printed – if donor fails platelet count, not entered onto computer • Loose labels in Processing on the bench • All barcoded donation numbers on a sheet of labels should be accounted for: ✓ Number used ✓ Number left ✓ Number discarded • Some labels placed straight on backs of red cell packs but there is no evidence that the adhesive is non-toxic to blood	• Deferred donor details are entered onto computer now so that all labels can be accounted for • **BUT** labels are still not kept secure & were left out unattended	
Donation *Apheresis*	• The donor & the questionnaire are separated at several stages during donor selection & collection but positive identification of the donor against questionnaire is not always performed • Rapid TTI tests are read after 15 minutes, but a timer is not used to ensure consistency • Label control - cannot reconcile all donation numbers printed because no entry of deferred donors where allocated with donation number • Increased risk of errors or mix-ups: ✓ collection of samples - inconsistent practices, collected into tubes before tubes labelled ✓ limited work surfaces – 2 work trolleys used for several donors at a time -> multiple paperwork, labels & samples • Potential contamination of donations or compromised donor safety - donor couches cannot be easily cleaned (covered in sheets), use of blankets (not all clean) • Potential compromise of platelet quality: ✓ stored in rocker stacked & label upwards (poor air circulation) ✓ not monitored or labelled as Quarantine ✓ transferred to Storage if space needed for new platelets – not labelled as Quarantine	• Barcoded donation numbers can all be accounted for now that deferred donor details are entered onto computer • TTI rapid tests are no longer stored in an unsuitable (substandard) refrigerator & are kept in the laboratory upstairs **BUT:** • The donation labels are still not held securely – they were left on the reception desk while staff were absent • Reagents are still not dated & signed when opened eg Microshield Handrub • The apheresis area has been enlarged but is not GMP compliant: ✓ the flooring has not been adequately sealed where a wall was removed to enlarge the area & it was very dusty & dirty ✓ there are holes in walls ✓ the ceiling panel above the platelet rocker is lifting ✓ cloth blinds are still used (heat is a problem) ✓ there are exposed, dirty pipes in the new section • The temperature in the apheresis room is measured but not close to the platelet rocker	

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
		where temperature is critical • The normal temperature range for the whole area is given as 21 - 26ºC but platelets should be stored at 20 - 24ºC (one rocker was not in a controlled temperature cabinet) • The platelet rockers should be clearly labelled as "Quarantine" or "Untested" • The rocker alarm was sounding for "No Battery" but this was ignored • Platelets are placed face down on cloth which is not a suitable surface for manufacturing areas (cleaning) • Platelets are still stored in apheresis until released • Release labelling of platelets still carried out in apheresis • Donor beds are still covered in cloth but the plastic arms of some chairs are left uncovered. Although plastic is a better surface for cleaning, the arms were not cleaned & some had leftover adhesive from tape/labels on them • Suggest use a plastic sheet under the donor's arm or continue to use the arms of the chair to allow easy regular cleaning • Records are available for cleaning, including the air-conditioners	
Mobile	• The Mobile venue was not satisfactory: ✓ Not clean ✓ Open to outside, windows open (no glass) ✓ Use of fans (no temperature control) • Potential contamination of donations - donor couches cannot be easily cleaned (covered in sheets) • Workflow: ✓ Good but crowded with lots of donors & volunteers passing collection & storage areas • Volunteers from local sponsor:	• Sample collection is significantly improved by use of bags with sample pouches which also reduces the high risk of contamination of the donation • Bedside scales are checked & recorded daily • Containers of swabs soaked in disinfectant are now kept covered which reduces the risk of drying out • Handling of the blood packs has improved: ✓ None were placed on floor ✓ The tubing was kept off the floor	SUGGESTION: • Put together a "Spill Kit" for Mobiles to take with them

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
	✓ provide donors with questionnaires (& assist donors with completion of forms?) ✓ handle sensitive medical information ✓ look after donors following donation (faints) • There were many inconsistent practices – eg sample collection, arm disinfection, mixing of donations • The containers of alcohol soaked swabs for disinfecting the arm were not labelled & were left open, with the risk of drying out • There was a very high risk of contamination of donations: ✓ Blood bags not placed on clean surfaces at any stage. Some were placed directly on the dirty floor, & the tubing from others was also lying on the floor ✓ Collection of the blood samples was unacceptable – the needle was removed from the donor's arm & lifted up to allow the blood (& air) to drain back into the bag, The contents of the bag were then mixed, & the samples collected by expressing blood from the bag through the needle into the tubes ✓ Collection & transport in unclean conditions ✓ Movement of unprotected blood bags through crowded, public areas past biohazard waste bins from truck to Centre • Risk of compromised donor health or donation quality: ✓ Donor scales not checked regularly (except for staff check) ✓ No stripping of collection line immediately after donation ✓ Temperature not monitored for unused blood bags or completed donations ✓ Unused blood bags not controlled - stored in donor recovery area • Risk of collection of unsuitable samples: ✓ Collected from bag not donor – samples therefore contained a mixture of anticoagulants & were also diluted by the anticoagulant in the blood pack ✓ Samples not always mixed for a long time after	✓ Stripping of bag was performed quickly ✓ Mixing of the blood bags was still variable but more frequent • Gloves are changed regularly • The Mobile refrigerated truck is much cleaner & temperature monitoring during transport has been improved **BUT:** • General comments about the venue itself are the same as the last report (not clean, open to outside etc) • Reagents are not labelled or dated (CuSO4, handrub, containers of pre-soaked cotton wool balls) • Rapid HBV is carried out inconsistently – one staff member labels strips to ensure there are no mix-ups but the other staff member does not. • The donor barcode is not placed onto the Questionnaire in the correct position. It is used to attach the sheet of remaining labels to the form & is placed on the form in a way that covers part of the questions • The arm disinfection technique is variable between staff • The start & finish times for donations are recorded on a form, but the form is not document controlled & there are no column headings to explain clearly what the information is. The information recorded was not always complete – finish times & volumes were missing for some donations. • There is a delay in sample collection from the pouch, increasing the risk of the blood clotting • Sample mixing is variable – some staff mix thoroughly, some do not mix well or do not mix at all • Labelling of tubes with the barcode number is done quickly & covers the Lot number & the fill line. There is a risk that incorrect volumes of blood are collected, & traceability to the Lot	

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
	collecting - clotting ✓ Tops often left off for a long time after collection – contamination ✓ There was no assurance that the samples were valid for testing • ABO (Rh)D screening carried out under uncontrolled conditions – near open window, spares in open esky next to window, no temp control • Unused sample tubes were placed by the window where it was very hot, with no temperature monitoring	number is lost. • Materials are not stored properly or securely: ✓ The area where boxes of spare blood bags are placed is not monitored for temperature ✓ Extra sample tubes & rapid HBV strips are stored in a public area where staff cannot see them. This area is also not monitored for temperature • Donors remove their own forms from the bedside after donation to get their certificates, but there is no reconciliation to confirm that all forms are handed in • The donor's venepuncture site is not covered with tape or a Band-Aid – several donors started bleeding again. This is an infection risk for the donor. • There was a blood spill on the floor which was not decontaminated or cleaned up properly (basic hygiene).	
Processing	• Not treated as therapeutic manufacturing area – staff and external waste collectors can go in & out without changing or using covers over shoes • Segments removed for archive & allowed to separate into red cells/plasma by gravity – is the preparation of these samples suitable for retesting? • There are no Processing rules applied to donations before centrifugation: ✓ Transport temperatures & times ✓ Maximum duration of donation time to ensure FFP will be acceptable quality (also important for whole blood platelets) ✓ Check of time since donation for each bag to ensure acceptable quality of FFP • Quality of donations not assured during handling: ✓ donations checked in hot, non-manufacturing area by Storage staff & transported upstairs – increases time out of controlled environment ✓ work area not temperature monitored	• The Processing area has been improved: ✓ There is a separate change room & everyone entering must change into protective clothing ✓ The workflow is much better ✓ The work area is monitored for temperature • Stainless-steel work benches are clean • Plasma presses are much cleaner • There are good records of centrifuge calibrations • Segments for archive are now removed as plasma after centrifugation & separation **BUT:** • Donation times are still not reviewed when deciding which components to make • Labelled red cells are still stored in the walk-in cold room with reactive & untested donations, but the different sections are well labelled • Plasma is still sent to Storage for freezing in an upright freezer	

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
	✓ length of time the donations are out at room temperature not monitored ✓ bags not always placed on clean surfaces eg rusty plasma press ✓ donation tubing was sometime hanging on the floor • Management of storage of quarantine vs released vs reject components – storage areas well labelled, but all stored in one Cold Room		
Mandatory Testing *TTI screening & ABO & Rh(D) Grouping*	• Workflow & documentation good • Work area not GMP compliant – plants & wooden surfaces, lack of cleaning behind equipment, blinds, dirty trolleys, carpet under waste bottle for Immucor • Access to area not controlled – TTI staff use change area to access BUT ✓ samples brought directly in from lift to sample area ✓ some staff enter & exit through rear fire door • Frozen plasma held in freezer room (Testing should be separate from processing & final product areas) • ABO - Performance of reagents potentially compromised: ✓ storage refrigerator not specifically designed for reagent storage ✓ operating at high end of acceptable range (7 to 8^{o}C), no action taken ✓ Monitoring of room temperature shows temperatures outside specification – no action taken • ABO compared against mobile manual testing as confirmation, not historical result (mobile testing is not controlled) • New donor results not confirmed by second test under controlled laboratory conditions • Results of ABO & antibody screening not entered onto computer • Uncapped samples moved outside into passage & left in public area for recapping • Records are not GMP compliant:	• The mandatory testing area has been improved by controlling entrance to the area through a Change Room • New Lot Numbers are now tested before use • The storage temperature of reagents is monitored • Pipettes for manual testing (malaria) are calibrated • The confirmation of donor blood groups has been improved: ✓ Returning donors – Neo test & history ✓ New donors – Neo test & manual tile group • But suggest the grouping results form is changed to include the manual result (plus Rh group) • Reagents are dated on opening **BUT:** • The results that are generated manually are not entered onto computer • The signatures on checks of results etc are not clearly explained • Thermometer for testing the room's temperature should be closer to the equipment	

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
	✓ not titled ✓ no reagent lot numbers ✓ no signatures of checks or approvals ✓ incorrect form used for antibody screening results ✓ printed out onto used paper		
Component Storage & Handling	• Good security to Storage department • Donations checked outside manufacturing area before being sent to Processing: ✓ Prolonged exposure of blood to warm temperatures ✓ Double-handling of donations ✓ Multiple manual recording • Risk of errors between released & unreleased components: ✓ stored together in the cold room without clear segregation & status labelling ✓ includes unreleased & small-volume components from mobile waiting for decision on use • Quality of components not protected: ✓ Plastic bags of potentially biohazardous plasma are stored in an upright freezer with released FFP ✓ FFP sent back upstairs to Processing for release ✓ After release, FFP transported back down to Storage • Chest freezers holding released FFP are well secured but are located in areas that are also used for storage of blood bags. The cartons of blood bags are on the floor so the area cannot be cleaned adequately • The chest freezers have expected ranges of -15ºC to -25ºC. Records show that some temperature checks were -17ºC. The Government Decree Blood Standard requires FFP to be stored at -18ºC to -25ºC. The freezers therefore do not always meet the Government requirements. • There is no evidence that FVIII levels are still acceptable at 12 months after storage in the chest freezers (NOTE: Council of Europe sets an expiry of 3	• Security to the component storage areas, rooms & most of the refrigerators & freezers is good • Donations from the Mobile collection are now taken straight to Processing where the numbers of donations are checked • Transport temperatures are recorded **BUT:** • Plasma for FFP is sent to Storage for freezing & then back to Processing for release labelling, then back to Storage for storage. This extra handling increases the risk of reduced FVIII levels	• One refrigerator could not be locked & was protected by a length of signed tape across the door to show if the refrigerator was opened after hours. This should be addressed

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)

	months for storage at this temperature range)
	• Quality of FFP stored for future fractionation cannot be assured:
	  • Storage conditions are very poor with excessive amounts of plasma stored between 3 walk-in freezer rooms
	  • Storage is inconsistent – FFP is stored in a mixture of plastic bags, cardboard boxes & heavy duty plastic storage boxes
	  • Some bags (from 20/06/2016) are lying on the floor right up against the dirty plastic strips at the entrance to the freezer room
	  • The storage of bags of plasma, stacked on top of each other, increases the risk of micro-fractures in the bags
	  • The expiry dates of the oldest plasma was not known
	  • Not all of the plasma units have "released" labels on them		

Component Release	• Platelets not placed on clean surface when released in Apheresis department – placed on wooden administration desk
	• Release of components is not controlled:
	  ✓ not performed in one dedicated area (performed in Processing AND in Collection)
	  ✓ release of platelets in Collection performed at paperwork desk **OR**
	  ✓ if platelets have been sent to Storage, labels printed & taken downstairs to be applied – high risk of error
	• High risk of release of components that do not meet requirements for ABO Rh(D) or antibody screening:
	  ✓ Computerised release labelling process only checks TTI results
	  ✓ Confirmation that ABO & antibody screening results are acceptable relies on assumption that staff will check & remove donations with mismatched blood groups or positive antibody
		• The release process is still not performed in a dedicated area
		• The release process has been changed slightly - the grouping & antibody results are sent to Processing for checking when labelling – this reduces the risk of incorrect groups being released,
		BUT:
		• The checking of blood groups at release is still a manual check that relies on people
		• Platelets are still labelled in apheresis
		• FFP still sent upstairs for labelling then back down to Storage – risk that temperature fluctuation may reduce FVIII	

GMP Section	Observations (21/11/16 – 26/11/16)	Key Risk(s)	New Observations (16/11/17 – 18/11/17)
	screening ✓ No certainty at point of release labelling that ABO Rh(D) confirmation & antibody screening on that donation have been done		
Process Control/QC	• Quality Control testing is performed by the Quality Manager	• QC testing & reporting are very good • Records are clear & traceable to donations, equipment & staff • Monthly summaries are prepared	SUGGESTION: • Review the monthly summaries at Management Review (Product Review)

GMP Assessment Follow-up Report

Blood Transfusion Hospital, Ho Chi Minh City

Reference: APEC Project No. CTI 30 2016A LSIF: *Closing the Gaps in Good Manufacturing Practices Compliance along the Blood Supply Chain in APEC Economies*

Objectives of Visits

Trip 1 (14 – 19 November 2016)

- Conduct an initial assessment of current practices against the requirements of Good Manufacturing Practice (GMP) to identify gaps in compliance.
- Provide a report of nonconformances to be addressed, with recommendations on corrective actions and prioritisation. (distributed January 2017)
- Provide training in GMP to staff, using the assessment findings as examples.

Trip 2 (13 – 15 November 2017)

- Conduct a follow-up assessment of progress made in addressing the GMP compliance gaps. NOTE: as the length of the visit did not allow a full assessment of all activities or all gaps, the review focussed on the recommendations and priorities from the first report.
- Provide further training on topics nominated by BTH that have caused difficulty in either comprehension or implementation.
- Provide a final report on review findings, including any new nonconformances identified.

Summary of Findings from Follow-up Assessment

Overall, the level of progress has been excellent and critical issues have been addressed satisfactorily.

During the first visit, it was clear that BTH already had very good systems and workflows in place. The two most critical issues identified at that time were related to storage of components and materials. Cleaning, documentation, traceability and label control were also issues.

There has been significant progress across all activities, particularly in the storage areas. All component storage facilities have been fitted with WIFI temperature checking systems and alarm checks are performed regularly. The material storage areas have been renovated re-organised and fitted with shelving to lift goods off the floors. Quarantine areas have been designated and goods are formally inspected before being approved for use.

Equipment is all calibrated and the computer system has been validated, although it is suggested that the staff validate the backup process to ensure the backed-up data can be restored properly and without loss. The level of cleaning has improved in all work areas and where flooring is still damaged, eg Processing, there are plans to replace it.

Critical labels are now controlled and there is good traceability to activities, reagents etc. Documentation is being improved as new documents or records are generated. Change Control and Validation systems have been established under the Quality Management System and are being successfully used. Risk assessment still needs to be built into some of the QMS processes.

The Mobile collections are run by the Red Cross. These have improved too, although a few minor issues were still occurring. The Red Cross Collection Centre was visited for the first time and a number of issues were identified (none critical) and are listed in this detailed report.

Table 1: Status of Priorities from Trip 1

	Activity	**Status**
1	Review & improve all component storage facilities including refrigerators, freezers (repair, clean, service, calibrate, temperature mapping)	Addressed
2	Review & improve material storage areas (repair, clean, re-organise, pest control, quarantine, reject areas)	Addressed
3	Review & improve work flow in Collection	Addressed
4	Review & improve records (including document control)	In progress
5	Start to develop & implement: • Change Control • Qualification & Validation	Addressed
6	Build risk assessment & management into Process Mapping, Corrective & Preventative Actions, Change Control, Qualification & Validation planning	In progress

GMP Assessment Follow-up Report

Centre: Blood Transfusion Hospital, Ho Chi Minh City **Dates:** 13 – 15 November 2017

GMP Section	Observations (14/11/16 – 19/11/16)	Progress Assessment (13/11/17 – 15/11/17)	New Observations (13/11/17 – 15/11/17)
Quality Management	• Not all Quality Management systems have been implemented: ✓ no Change Control process ✓ no Qualification & Validation system ✓ no Risk Management system	• There has been very good improvement - additional systems have been developed & are being used CHANGE CONTROL: • The SOP has been developed but needs a supporting Change Plan (form) for: ✓ List of activities required ✓ List of staff responsible for each activity & the timeframe QUALIFICATION & VALIDATION: • Several validations/qualifications have been completed eg blast freezer, transport • There is a Master list of all equipment with information on requirements for IQ, OQ, PQ • **BUT** it needs some changes to the information: ✓ DQ is the responsibility of manufacturer – CE marking etc should be provided as part of IQ ✓ OQ is not the same as monitoring of performance ✓ Ensure requirements are general – each item of equipment can be slightly different RISK MANAGEMENT: • A high level Risk Register has been developed • **BUT** still need to include Risk Assessment activity in Change Processes & CAPA: ✓ Changes: → what are the risks of the change	

GMP Section	Observations (14/11/16 – 19/11/16)	Progress Assessment (13/11/17 – 15/11/17)	New Observations (13/11/17 – 15/11/17)
		→ what steps do you need to take to prevent them (include as part of the Change Plan) ✓ CAPA: → What are the risks to components, donors, staff, test results etc? → What steps must you take for the components, donors, staff etc?	
Personnel & Training	• There is no GMP training for staff or contractors eg the people removing waste & delivering samples from Collection to Processing, volunteers on mobiles	• A training schedule is in place • Training assessments & records are in place • Training for specific tasks eg TTI must include principles of GMP • Volunteers are given information on GMP (handling of blood, maintaining donor confidentiality etc) but there are no records	• No records of training given to volunteer staff
Documentation	• Critical documents & forms (eg the donor questionnaire) have unique document identifiers but no dates effective • The unique document identifier is covered by labels in some cases eg the apheresis form used to record the apheresis machine number & other details – the barcode donation number is placed over part of the document control number • Not all records are document controlled eg the log books for delivery of whole blood to Processing, the temperature checks for the blood bag storage area • Not all instructions are document controlled eg the instructions taped to the front of the Compomats in Processing	• New documents reviewed have dates effective • Some older documents still need document control &/or dates but this is ongoing work	
Records	• Some records are not filled out correctly: ✓ Some donor questionnaires have results written manually in the bottom right-hand margins – it was said these were from the previous donations (should have proper fields as part of the form in which to write the information) ✓ Other questionnaires have initials written in the margin, but it is not clear what these mean ✓ There are some blank spaces in the donor questionnaires	• More critical activities are now recorded eg cleaning records • Quality/GMP records should be document controlled • There is still some over-writing when making changes • Some temperature monitoring records show temperatures outside the specification but no action had been taken	

GMP Section	Observations (14/11/16 – 19/11/16)	Progress Assessment (13/11/17 – 15/11/17)	New Observations (13/11/17 – 15/11/17)
	✓ The temperature checks for the Fiocchetti sample refrigerator in donor assessment (Serial no. KT3-02906NH6/1) are not recorded to one decimal point even though the temperature display reads to one decimal point (eg 4.2ºC is recorded as 4ºC) ✓ Labels are placed over the document identifier eg in apheresis ✓ A number of forms have information written in the margins. If this information is important, the form should be changed to include formal fields to enter it into. ✓ Some mistakes are corrected by overwriting • There are good records for equipment servicing etc, but some require more detail of testing performed, results achieved, expected ranges & a conclusion • There are no records or the records are inadequate for cleaning (manufacturing areas, work surfaces, storage facilities)	• Temperature ranges on records need to differentiate between “normal ranges” vs “equipment or material limits”	
Traceability	• There is no traceability of tests to Lot numbers: ✓ ABO antisera in assessment ✓ HBV rapid test strips • Some temperature checking records were not linked to the relevant equipment or the work area eg the Fiocchetti sample refrigerator in assessment (Serial no. KT3-02906NH6/1) • There is no traceability to staff performing critical steps during collection & processing (initials on the blood bag are not records because the bag is sent to the hospital or discarded as expired) • On a few records, a name stamp is used instead of an actual signature. Traceability requires an original signature	• Traceability is greatly improved: ✓ There is a signature register ✓ There are records for batches of donations ✓ Each staff member collecting blood uses a worksheet to record the barcodes of the donations they have collected ✓ There is traceability of records to equipment or work areas • Name stamps are still used, but <u>with</u> the staff signature	
Electronic records/data	• The computer system has not been validated	• Validation has been carried out on normal operations • **BUT** need to include: ✓ confirmation that reactive results will not allow release label printing	

GMP Section	Observations (14/11/16 – 19/11/16)	Progress Assessment (13/11/17 – 15/11/17)	New Observations (13/11/17 – 15/11/17)
		✓ confirmation that incomplete results will not allow release label printing ✓ copies of screen prints showing the messages	
Buildings & Premises	• Cleaning of work areas has not included thorough cleaning behind & under equipment, in corners etc & dust, dirt, wiring & other items are present • Some benches are chipped, or the joins are not sealed, & cannot be thoroughly cleaned • Dirty piece of cardboard acting as PC mouse on bench next to Hb/cell counter (ABX Micros) • Bare, unravelled wires from PCs on benches • Environmental temperatures are measured & recorded but some of the monitors are placed on walls too high for staff to read accurately eg in the apheresis room • Storage areas for material are not tidy, regularly checked or cleaned: ✓ External windows in the blood bag storage area are not sealed & there is a space between the window & the frame, allowing dust & dirt to enter the room ✓ There are holes in the walls & dirty piping along the walls or ceilings ✓ Goods are stacked on plastic pallets that cover the floor, preventing the floor from being cleaned ✓ The storage areas are full of goods, preventing access to all parts of the rooms for cleaning	• There has been great improvement in the level of cleaning: ✓ Benchtops ✓ Trolleys ✓ Floors behind & under equipment • Records of regular cleaning are now kept • Some benches still have chipped areas at edges • Flooring shows some damage eg in Processing, but there is a plan to replace it MATERIAL STORAGE AREA • This is significantly improved: ✓ Clean ✓ External windows are sealed ✓ Holes have been repaired, dirty piping covered ✓ New shelves – goods stored off the floor, can clean underneath ✓ Better organisation – can walk around ✓ Pest control in place ✓ Good records of cleaning & temperatures ✓ Goods stamped with date & status after inspection ✓ There is an area for quarantine	
Waste Management	• Contaminated waste is removed by contractors from the Collection area, & carried through the donor waiting area. The bags are then placed outside the donor restrooms waiting for further removal. The bags are not all sealed & are therefore potentially hazardous for the donors.	• Waste handling has been addressed	
Equipment Management	• Some items of equipment are not cleaned regularly eg the scales in Processing where blood is received have old adhesive on the surfaces	• Equipment is now clean • Where required, all equipment has been	

GMP Section	Observations (14/11/16 – 19/11/16)	Progress Assessment (13/11/17 – 15/11/17)	New Observations (13/11/17 – 15/11/17)
	• The Compomats in Processing cannot be cleaned thoroughly because instructions are taped to the outside surface in front • Equipment servicing records are in place but are not detailed, & have lots of fields that have not been filled in or crossed out	calibrated	
Component Storage Equipment	• The general state & cleanliness of the component storage equipment (refrigerators, freezers, walk in cool rooms & freezer rooms) are not acceptable: ✓ The cold room has rusted patches on floor & wall ✓ There are cardboard boxes, cold boxes & reagents on the floor in the cold rooms, preventing thorough cleaning ✓ Condenser piping in the cold room used to store released blood has been wrapped in material that cannot be cleaned ✓ The freezer rooms are iced up & there are blocks of ice on the ceiling & at the doorway ✓ The freezer room has numerous unclean cardboard boxes on the floor, containing segments ✓ There are dirty "welcome" mats on the floor inside the door of the freezer room • There is no evidence to show that the component storage equipment is functioning correctly & accurately: ✓ Not all equipment has a temperature display that gives a reading to one decimal point, or the temperature is not recorded to one decimal point, therefore the accuracy of the temperature cannot be assured ✓ Temperature probes are not lagged in water & therefore only read air temperatures which are not representative of the temperature of components ✓ Alarms are not checked regularly • The platelet rockers have not been cleaned regularly & there is an old barcoded donation number label stuck to the outside of one	• Walk-in facilities: ✓ These have been cleaned & rust patches have been removed ✓ They have all been tidied ✓ Ice build-up has been removed **BUT** not from all ✓ Old cardboard boxes have been removed where possible ✓ Condenser piping has been cleaned • All blood & reagent storage equipment now has WIFI temperature monitoring to one decimal point, with regular alarm checking • Some probes have been lagged, but a few have not	

GMP Section	Observations (14/11/16 – 19/11/16)	Progress Assessment (13/11/17 – 15/11/17)	New Observations (13/11/17 – 15/11/17)
Material Management	• There is no incoming inspection of the goods against the specification or any formal approval for use • There are no designated areas for Quarantine and Reject goods • There is no traceability to receipt of goods including different deliveries of the same Lot Numbers • Storage areas for material are not tidy, regularly checked or cleaned: ✓ External windows in the blood bag storage area are not sealed & there is a space between the window & the frame, allowing dust & dirt to enter the room ✓ There are holes in the walls & dirty piping along the walls or ceilings ✓ Goods are stacked on plastic pallets that cover the floor, preventing the floor from being cleaned ✓ The storage areas are full of goods, preventing access to all parts of the rooms for cleaning • Reagents are not dated or signed when opened or when prepared: ✓ ABO & Rh(D) grouping antisera ✓ Blood bags (aluminium foil packets – 15 day expiry) • There is no assurance that TTI reagents are stored at the correct temperatures in the laboratory: ✓ A second independent temperature check is not performed ✓ The temperature probe is not placed in water & therefore only measures the temperature of air ✓ The cold room has large patches of rust & tubing from the condenser that is covered in dirty tape	• There is an area for quarantine of incoming goods – need to think about an area for "Reject" materials • Goods are stamped with the date & status after inspection & approval for use • The condition of the storage areas is significantly improved: ✓ They are clean, with new shelves that lift goods off the floor for easy cleaning ✓ External windows are sealed & holes have been repaired, dirty piping covered ✓ There is better organisation & staff can walk around the area ✓ Pest control is in place • There are good records of cleaning & temperatures	
Label Control	• The use of barcoded donation numbers is not controlled: ✓ Sets of spare labels are kept on the desk in the reception area, although they are out of sight of the donors • All barcoded donation numbers on a sheet of labels	• New SOPs describe the structure & usage of donation numbers • Appears well controlled now by checklist	

GMP Section	Observations (14/11/16 – 19/11/16)	Progress Assessment (13/11/17 – 15/11/17)	New Observations (13/11/17 – 15/11/17)
	should be accounted for: ✓ Number used ✓ Number left ✓ Number discarded		
Collection *(see also comments under Mobiles)*	• The workflow involves the movement of donors backwards & forwards from the waiting room to the assessment room & the testing room. It is suggested that the workflow be reviewed & if possible, revised to be one-directional. • There is no privacy for the donors to fill out their questionnaires & they must fill them out next to each other • Reagents are not dated & initialled on opening: ✓ ABO grouping antisera ✓ Braunoderm arm disinfectant ✓ Microcuvettes for the Haemoglobinometer • The equipment used to measure Hb & cell counts as part of assessment are regularly checked & there are good records available. It is suggested that these forms are document controlled & the signature at the bottom of the form is explained eg "Checked by:" • The donor couches & the arms of the couches are covered in a replaceable fabric sheet but it is not clear if the couch itself is cleaned daily. Some of the covers under the donors' arms showed that they were not always clean (possible iodine staining) • One single workstation between donor couches is used simultaneously for 2 donors, increasing the risk of mix-ups between donors (paperwork, labels) • The date of collection & the initials of the person collecting the donation are not always written in the correct places on the donation label • The time of the donation is not timed to confirm suitability for platelets or FFP	• Workflow for donors appears improved but donors still fill out questionnaires next to each other • Reagents are dated when opened • The Collection area is much cleaner & tidier: ✓ Waste marked more clearly, removed safely ✓ Surfaces eg trolleys clean ✓ Replaceable sheet covering donor couches changed every day • Checklist used to check process for separating donor paperwork & barcodes at the bedside • Donation times are still not recorded • Donation sealed & placed into monitored cool box • Environmental temperatures monitored: ✓ Many readings out of range ✓ Normal range 22 – 26ºC ✓ Higher than allowed for PAS & ACD ✓ No action taken or noted ✓ Machine limits?	
Apheresis	• Donors fill out the same questionnaire as WB donors, but some forms are not filled out at the time of donation – the donors fill them out, are assessed & then come back another day, using the same form	✓ Donors now complete a new questionnaire if they come back to donate the next day	

GMP Section	Observations (14/11/16 – 19/11/16)	Progress Assessment (13/11/17 – 15/11/17)	New Observations (13/11/17 – 15/11/17)
	• Platelets are placed onto trolleys right next to or even touching waste bags with contaminated waste in them • The tubing of the platelets hangs down into unclean cardboxes etc • The bags are labelled with 2 barcoded donation numbers – the "spare" label is not placed in a consistent position & is often on the plastic of the bag rather than the bag label. There is no information to demonstrate that the adhesive on the labels is non-toxic for the component		
Mobile *RED CROSS*	• The assessment is not carried out in private or in a manner that provides aural & visual privacy • Donor questionnaires are handled by a volunteer who organises the flow of donors, therefore confidentiality of sensitive donor information cannot be assured • Blood bags were not always placed on cleaned surfaces on board the bus • It was not clear how the kitchen scales were checked for accuracy • There were no records of temperature checks for the blood storage refrigerator on board the bus.	✓ The issues identified last year have been resolved: ✓ Volunteers receive information on handling confidential data ✓ Doctor's assessment is separate from the rest of the activities ✓ Clean surfaces are used for blood bags at most points ✓ The temperature of the bus & refrigerator are monitored ✓ The scales for weighing the blood bags are checked weekly ✓ Overall comments: ✓ The work flow is good ✓ A non-invasive Hb method is now used ✓ Technicians showed good venepuncture techniques ✓ Sample collection was carried out well **BUT:** ✓ The donor's identity card was not checked against the information on the questionnaire ✓ The process of disinfecting the arm was not consistent ✓ Bags were not always placed on clean surfaces during collection ✓ The donation was only mixed a few times during collection ✓ The donation was not weighed until near the end	

GMP Section	Observations (14/11/16 – 19/11/16)	Progress Assessment (13/11/17 – 15/11/17)	New Observations (13/11/17 – 15/11/17)
		of the collection, increasing the risk of an overweight donation	
Collection Centre *RED CROSS*	NOT VISITED		✓ The donor's identity card was not checked against the information on the questionnaire • There was no donor confidentiality during assessment • The CuSO4 container was not labelled with the contents or dated • The foil packets containing new blood bags were not dated or signed when opened • The technique for arm disinfection was not consistent • The time of venepuncture was written onto the blood bag before the arm disinfection process so would not always be accurate • Temperatures are not monitored where the blood bags are stored downstairs or upstairs
Processing	• There are no Processing rules applied to donations before centrifugation: ✓ Transport temperatures & times ✓ Maximum duration of donation time to ensure FFP will be acceptable quality (also important for whole blood platelets) ✓ Check of time since donation for each bag to ensure acceptable quality of FFP	• The temperature of the transport box is checked when blood is received from collection • The duration times of donations are not recorded & therefore not used to determine suitability for platelets or FFP	
Mandatory Testing *ABO & Rh(D) Grouping, TTI screening & NAT*	• There is good traceability of samples transported to the testing laboratories, but not all forms are document controlled • After testing, samples are stored without their tops at 2 – 6^{o}C	• Qwalys reagents did not always appear to be labelled with the date of opening	
Component Storage & Handling	• Platelets are placed into the rockers label side up, preventing good air circulation	• Handling of platelets still needs to be improved	
Component Release	• No comments	• Workflow is very good – the workflow is one direction & one component at a time • Donations are timed for the period they are out at	

GMP Section	Observations (14/11/16 – 19/11/16)	Progress Assessment (13/11/17 – 15/11/17)	New Observations (13/11/17 – 15/11/17)
		room temperature (good control) • A label is now placed onto each frozen component not just the outer plastic bag • Cryoprecipitate from 2 different donors labelled with the donation number of one of the donors but traceability on computer appears good	
Process Control/QC	• Quality Control testing is performed on approximately 0.3% components. Although this meets the Viet Nam Ministry of Health Circular (Number: 26 / 2013/TTMOH) requirement of 0.1% to 1%, it is well below international standards of a minimum 1% sampling.	• Sampling has been raised to 1% components	

GMP Assessment Follow-up Report

Hue Blood Centre

Reference: APEC Project No. CTI 30 2016A LSIF: *Closing the Gaps in Good Manufacturing Practices Compliance along the Blood Supply Chain in APEC Economies*

Objectives of Visits

Trip 1 (28 November – 03 December 2016)

- Conduct an initial assessment of current practices against the requirements of Good Manufacturing Practice (GMP) to identify gaps in compliance.
- Provide a report of nonconformances to be addressed, with recommendations on corrective actions and prioritisation. (distributed January 2017)
- Provide training in GMP to staff, using the assessment findings as examples.

Trip 2 (06 - 08 November 2017)

- Conduct a follow-up assessment of progress made in addressing the GMP compliance gaps. NOTE: as the length of the visit did not allow a full assessment of all activities or all gaps, the review focussed on the recommendations and priorities from the first report.
- Provide further training on topics nominated by Hue Blood Centre that have caused difficulty in either comprehension or implementation.
- Provide a final report on review findings, including any new nonconformances identified.

Note:

The review of progress at the Hue Blood Centre was compromised by severe flooding through the city. This situation resulted in the review being curtailed when the Centre was closed and staff sent home. Donors were also reluctant or unable to attend while the Centre was open and therefore opportunity to properly observe activities was restricted, and no further training could be provided.

Summary of Findings from Follow-up Assessment

Overall there have been some good improvements to premises, workflows and processes, but the Blood Centre has been restricted by lack of funding which is provided by the Hospital. As a result, several critical issues have not been addressed and there are no plans yet to do so.

A Quality Manager has only recently been appointed, consequently there has been little work done on developing and implementing GMP (including a Quality Management System).

Generally, the premises are cleaner and there have been improvements, particularly in the Processing area where a change-room has been established and damage to the benches and flooring has been repaired. The storage area for components next door to Processing has been reorganised to clearly separate tested from untested and reactive components. The TTI area has also been improved and flooring repaired although a change-room is still needed. Several room temperature material storage areas have been cleaned and reorganised to allow thorough cleaning, however the storage of blood bags in a corridor outside the Crossmatching/Storage department is not secure.

Some processes have been improved. The donor assessment is now performed confidentially and the donor flow through Collection is much better - donors have an enforced rest and refreshment while waiting for their certificates. The process for rapid HBV testing and blood grouping of new donors is now more controlled. Processing activities (pooling etc) that were performed in Crossmatching/Storage have been transferred to the Processing department.

However, several critical processes have not yet been addressed. Donors are still not assessed for Haemoglobin levels – attempts to prepare suitable CuSO4 solutions have not been successful. Traceability of staff to activities continues to be poor. Barcoded donation numbers are still not used, and the donation numbers have to be handwritten on the blood bags and all records. While there is now good physical separation of tested and untested components (different storage facilities), there is still no formal release process requiring every component to be checked for non-reactive TTI results and a confirmed blood group. The tested and untested components can only be differentiated by their storage location and not by a clear release label. This remains a high risk. Blood grouping does not include a reverse group.

Table 1: Status of Priorities from Trip 1

	Activity	**Status**
1	Quality Management System	Not addressed
2	Traceability	Not addressed
3	Labelling Components	Not addressed
4	Component Segregation	Mostly addressed - physical separation but no release labels
5	Component Release	Not addressed
6	Donor Selection & Donation	Partly addressed
7	Workflows	Addressed
8	Equipment	Partly addressed
9	Equipment (Component Storage)	Partly addressed – but not walk-in facilities
10	Quality Control	Partly addressed
11	Records	Improved
12	Buildings & Premises	Mostly addressed
13	General	Variable progress

GMP Assessment Follow-up Report

Centre: Hue Blood Centre **Dates:** 06 & 07 November 2017

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
Quality Management	• There is no Quality Manager • There is no formal quality management system in place	• A Quality Manager has been appointed but only recently – Mr **ĐỨC.** • GMP meetings are being held as Management Review meetings. • No Quality Management System has been developed yet • The Document control process needs to be given priority: ✓ SOPs have no version numbers or dates effective ✓ Reviews & approvals are not dated ✓ Some SOPs are several years old – there is no evidence that they have been reviewed to see if they are still accurate • Second priority should be given to: ✓ Change Control ✓ Equipment & material management, qualification & validation	NOTE: • The future focus of the Centre will be to implement ISO 9001 QMS (NIHBT project) • It is critical that Hue does NOT ignore GMP: ✓ Remember that GMP requirements include requirements for QMS ✓ GMP will improve safety as well as quality ✓ These requirements are specific for manufacture of blood components
Personnel & Training	• There is no GMP training for staff or contractors eg waste removers • There is no GMP training for volunteers handling sensitive donor information	• NOT ADDRESSED – no action taken yet	
Documentation	• There is no document control system for critical documents & forms eg the donor questionnaire: ✓ There are no unique document identifiers ✓ There are no version numbers ✓ There are no dates effective ✓ Most documents are not formally approved ✓ Some SOPs have been approved but the	• NOT ADDRESSED – no action taken yet	

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	approvals are not dated & the SOPs have no date effective		
Records	• Many records are not filled out correctly: ✓ Missing information ✓ Blank spaces ✓ Information entered into incorrect places or into the margins ✓ Mistakes corrected by using "correction fluid" ✓ Information written on blank pages with no details ✓ Some mistakes corrected by overwriting ✓ Not filled in at the time eg syphilis results all pre-entered as negative & controls as positive before testing has been completed ✓ Action not taken for out-of-range results eg refrigerator & freezer checks • There is a lot of manual entry of critical records at all stages of assessment, collection, processing etc. These entries are not checked for accuracy & there is a very high risk of error in transcribing the data • Some records only require the year of birth, not the full date of birth. The full date of birth is a key requirement for identification • There are no records or inadequate records for critical activities: ✓ Service & maintenance of equipment ✓ Cleaning records (manufacturing areas, work surfaces, storage facilities)	• The standard of record keeping has not improved: o Many records are not complete ✓ They are not linked to equipment ✓ No action is taken for readings that are out of acceptable range (high) ✓ Blank spaces that do not need to be filled in are not crossed through ✓ Some records contained errors which were not identified when the errors were reviewed by a second staff member (QC)	
Traceability	• There is no traceability of tests to Lot numbers: ✓ ABO & Rh(D) antisera ✓ HBV rapid test strips • Traceability requires staff signatures but some staff only use name stamps • Some temperature checking records were not linked to the relevant equipment or the work area • There is no traceability to staff performing critical steps during collection & processing (initials on the blood bag are not records because the bag is sent to the hospital	• There is now traceability to the staff carrying out rapid HBV testing & blood grouping of new donors in Collection but not to reagents used • Traceability for other activities has not been improved	

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	or discarded as expired) • There is no traceability showing which staff member formally released components or checked the release results		
Electronic records/data	• The computer system has not been validated • Data is backed up daily but only onto paper or email • Access to the backup & recovery function is restricted to one IT person – no-one else knows how to access backup & recovery or where the backup information is held • There are no records of IT activities eg backups or laptop refreshes for the Mobiles • Automated spreadsheet tools developed by TTI staff & using donation data entered on computer in Collection have not been validated for accuracy	NOT REVIEWED	
Buildings & Premises	• Cleaning of work areas has not included thorough cleaning behind & under equipment, in corners etc & dust & dirt are present • Some areas cannot be thoroughly cleaned because of: ✓ Holes & cracks in floors, walls & ceilings ✓ Exposed wiring ✓ Keeping windows open eg Collection ✓ Unsuitable joins in benchtop surfaces ✓ Use of wooden furniture ✓ Presence of plants ✓ Banners hanging from the wall (TTI) • Temperatures in manufacturing areas are not always monitored eg in Processing where it was very warm • There is no pest control program • Security is poor for all areas & anyone can enter any area • Some equipment is located in general access corridors eg the platelet rockers outside Crossmatch	• There has been some improvement in the condition of: ✓ Materials storage areas ✓ Processing ✓ TTI laboratory ✓ Component storage areas • The platelet rockers outside Crossmatch/Distribution have been removed	
Equipment Management	• Many items of equipment are not regularly cleaned, calibrated or checked: ✓ Sphygmomanometer	• Cleaning of some equipment is now in place	

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	✓ Donor scales ✓ Delcon Hemomix2 (automatic blood mixers) ✓ Scales used in Processing ✓ Thermometers ✓ Heat sealer • Some equipment eg centrifuges cannot be cleaned properly because they have old stickers & remnants of adhesive on them		
Component Storage Equipment	• The general state & cleanliness of the component storage equipment (refrigerators, freezers, walk in cool rooms & freezer rooms) are not acceptable: ✓ Upright freezers are badly iced up, with ice over & around the components ✓ Seals have been damaged by the degree of ice around the edges of the freezers ✓ One upright freezer has a small unlabelled plastic container buried in the ice, & an unlabelled plastic bag of plasma with a biohazard label on it – it was not clear what these were, but it was thought they belonged to the TTI laboratory. If they are TTI reactive materials, it is unacceptable to knowingly store them in a freezer used for transfusible components ✓ A number of items are stored behind the upright storage facilities, including boxes, gas canisters & personal clothing ✓ One upright refrigerator had a significant amount of foamy discharge that had leaked from the back of the facility & solidified ✓ The cold room in Processing is in poor condition: ✓ There are rusted patches on floor indicating leakage or excessive condensation ✓ Unlabelled plastic bags of old components & samples are lying over the floor ✓ The Crossmatch freezer room has had water leaking from a down pipe which has frozen into a waist-high mound of ice, & the door & plastic curtain have considerable ice hanging from the top in the entrance, suggesting incomplete sealing of	• The component storage equipment issues in Crossmatch/Distribution have not been resolved & there is no assurance that the components are being stored at the correct temperatures • Blood refrigerators: ✓ do not have no alarms ✓ have excess moisture (shows poor seals around doors) ✓ are running at a high temperature • Plasma freezer: ✓ is iced up • The freezer room in Crossmatch/Distribution that store the samples: ✓ there is excess moisture leaking out of door ✓ the plastic strips hanging in the doorway are iced up ✓ the door seals are poor ✓ the flooring is badly iced (dangerous) • There is no regular calibration or servicing in place • Records of cleaning etc show that there are inconsistent practices • Many records are not complete: ✓ They are not linked to equipment by a serial number ✓ No action is taken for readings that are out of acceptable range (high) ✓ Blank spaces that do not need to be filled in are	

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	the door ✓ The freezer room is not clean & has some bags of unknown materials also lying on shelves ✓ The Crossmatch refrigerators are not clean & there seems to be excess condensation ✓ There are patches of rust at the corners of the doors • There is no evidence to show that the component storage equipment is functioning correctly & accurately: ✓ Temperature records are not linked to the equipment & there is no operating range written on them ✓ Some temperature readings are not recorded to one decimal place ✓ Chart recorders are in place on some equipment but are not used ✓ Equipment does not all have two independent temperature probes that enable temperatures to be compared & confirmed ✓ One of the Crossmatch refrigerators was at a temperature of 12.6^{o}C according to the display, but was ignored ✓ The temperature probes, where visible, are not lagged in water & therefore only read air temperatures which are not representative of the temperature of components ✓ One Crossmatch refrigerator has a thermometer placed in an old blood bag filled with water but the readings are not compared against a display ✓ Temperature mapping has not been carried out & the cold/warm storage spots are not identified ✓ Alarm checks are not performed ✓ Some door seals appear to be damaged & do not maintain a good seal when the doors are closed • No action has been recorded for several refrigerator readings that are out of range • An alarm for liquid nitrogen storage containers of frozen red cells was sounding but no action was taken • There are no records for temperature checks of the	not crossed through ✓ The temperatures of the second thermometers are not recorded	

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	platelet rockers in Crossmatch		
Material Management	• Materials are not adequately stored in secure, designated, controlled areas eg numerous boxes of Cobas ProCell M stored in a corridor • Materials are not transported adequately for use eg the rapid HBV strips for testing in the donation area were carried & held in a shopping bag • There is no incoming inspection of the goods against the specification or any formal approval for use • A number of very badly damaged boxes of Fresenius ACD for apheresis had been accepted & were stacked on the floor in a corridor near Crossmatch with other blood bag cartons • There are no designated areas for Quarantine and Reject goods • There is no traceability to receipt of goods including different deliveries of the same Lot Numbers • The storage areas are not neat & tidy, & cannot be cleaned properly because of numerous boxes placed straight on the floor • Temperature monitoring is not adequate • Numerous cartons of blood bags are stored in a corridor near Crossmatch that can be accessed by many different people including the public • The conditions for refrigerated storage for reagents cannot be assured: ✓ The glass panels in the door show excessive condensation ✓ The side of the refrigerator show signs of mould growth • Reagents are not dated or signed when opened or when prepared: ✓ ABO & Rh(D) grouping antisera ✓ Blood bags (aluminium foil packets – 15 day expiry)	• The material storage areas are much neater & tidier • Most goods are now stored off the floor, allowing easier cleaning • Boxes of blood bags are still stored in the corridor outside Distribution – this is a general area with no security • Temperatures are still not monitored in any storage area • There is no incoming inspection of goods with formal approval & release for use • There are no designated areas for quarantined or rejected materials • Quarantined & released materials cannot be differentiated from each other • The central area (anteroom) between the walk-in cold room & the walk-in freezer room in Crossmatch/Distribution is used to store reagents (syphilis, gel cards) but there are no condensers in the room, and temperatures are not monitored	
Label Control	• There is no control of critical labelling: • Barcoded donation numbers are printed only for the 2	• The labelling of the sample tubes by TTI staff has improved – the fill mark is not covered by the label now & Collection staff can add the correct volume	

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	sample tubes which are pre-labelled • All other labelling is performed by manual transcription (blood bags, donor questionnaires, component labels etc) • The lot numbers & fill marks on the tubes are covered by the labels placed on by the TTI staff resulting in significant variation in the volume of sample collected • There is no control on the numbers printed & it is possible to print the same numbers twice • The label numbering system is high risk: ✓ There is an eye readable number across the top of the label which staff are required to use for the bags, paperwork etc ✓ The bar code, on the two labels is different – one has "-00" added to the end of the number (to show that it is a serum sample), the other has "-05" added to the end of the number (to show that it is an EDTA sample) ✓ The printouts from the TTI screening equipment record the full numbers, ie they are different to the numbers assigned to the donors. This is a conflict	of blood to the tubes • No other changes have been made & the lack of label control is still very high risk	
Collection	• Volunteers are used to help with the donors, & therefore handle sensitive donor information • The donor & the questionnaire are separated at several stages during donor selection & collection but positive identification of the donor against questionnaire is not always performed • Donor information is not kept confidential during checking of the donor's records on computer because donors can sit & wait for interviews etc immediately behind the computer desk, & the screen is visible to all of them • Donor assessment is not satisfactory: ✓ There are several interview rooms but other donors are allowed to go into the rooms to wait, or are assessed in pairs & therefore there is no confidentiality for the medical & risk assessment ✓ Donor Hb is not measured ✓ Not all donors are weighed - there is only one set	• There is good signage on walls that give advice for donors before & after donation • The workflow is now much better for donors' health – donors now take their refreshments while waiting for their certificates • The computer screen has been moved so that the donor details cannot be seen by other donors – this maintains the donor's confidentiality • There are donor scales in each assessment room • The process for rapid HBV screen & blood group on new donors has been improved: ✓ better process controls have been implemented - one sample is tested at a time ✓ the test cards/tiles are numbered to link to the donor ✓ the staff performing the testing now sign the donor's form	• Gloves not changed or hand disinfectant used between donors

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	of scales in one interview room • Samples collected from new donors for grouping & rapid HBV screening are often a much smaller volume than the tube requires, but there has been no validation to show that the excess anticoagulant does not affect test result • Two staff members carry out rapid HBV testing & blood grouping on new donors, working on a single sample at the same time. This is high risk for mixing the samples up. • Testing is carried out on a white cloth sheet that is not a suitable surface that can be cleaned easily. Some blood stains were present. • Donor questionnaires are handled with dirty gloves at the testing bench • The samples are centrifuged for the rapid screen but are not inspected for integrity. This would be an ideal point to identify donors with lipaemic plasma & exclude them from donation • The allocation of donation numbers is very high risk for error because of manual transcription of critical data without second checks: ✓ The only printed donation barcode numbers are produced in the TTI department & placed on sample tubes ✓ These numbers are pre-written into a log book & donor details are hand-written against each number, without checks. The donor's full date of birth is not recorded on the computer – only the year of birth. ✓ The donation numbers are then handwritten on to the blood bags but are not checked. This is high risk for errors in transcription • A secondary sequential numbering system is also used for paperwork, blood bags & tubes. These numbers start at "0" (zero) every day & for the ABO grouping & rapid HBV test, they are the only identifying number on the tube. This double-numbering adds to the risk of errors. • Blood bags are not always placed on clean surfaces:	✓ grouping antisera is dated when opened ✓ the testing is performed over disposable table cloths ✓ if sample shows lipaemia after centrifugation, the donor does not donate • Donor identity is now confirmed at critical points after registration • Sample collection process has improved: ✓ fill line & lot number not covered by label ✓ correct volumes collected ✓ haemolysis minimised • The donor questionnaire is still not document controlled and contain the error "HBC" instead of "HBV" • The donor's identity is not confirmed at registration: ✓ the donor writes their own Số CMND on the donor questionnaire o this is not checked against their official card by staff • Donor haemoglobin is not tested (a trial of $CuSO_4$ has not been successful) • Donation numbers are still handwritten many times • The foil packets containing blood bags are not dated & signed when opened • Blood bags are handled by the donors while they wait for a donor bed to become free (increased risk of contamination) • The temperatures of the rooms are not monitored or recorded • The process for arm disinfection is variable between staff members • The donation is not timed	

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	✓ Placed on wooden surfaces during allocation of donation numbers ✓ Blood bags allocated to donors who were not there when called are placed on blood bag cartons with the tubes ✓ Blood bags are handled by the donors ✓ Tubing is placed into dirty clamps on the Hemomix automatic bag mixers • The blood bags, paperwork & tubes are handed to the donors to look after until they are called to donate. This increases the risk of mix-ups with other donors/friends. • One single workstation between donor couches is used simultaneously for 2 donors, increasing the risk of mix-ups between donors (paperwork, labels) • Lengths of tape to secure the needle & donor tubing are re-used. Between each donor, they are stuck to the armrest or the workstation, increasing the risk of contamination • Arm swabbing is not performed consistently between different staff • Trays of iodine-soaked swabs are left open on the workstation & can easily dry out becoming ineffective, especially one tray that was near an open window • The Hemomix automatic scales are not clean – in some cases the clamps were very dirty • The duration of the donation is not timed • The sample collection method uses a knot to maintain a closed system for the blood bag, but the volume placed into each sample tube is not measured & the tubes all have very different volumes of blood in them. Some are overfilled compared to the amount of anticoagulant, others are underfilled. • Staff safety cannot be assured because needles are recapped • There is no traceability to lot numbers of blood bags, grouping reagents, staff or critical activities • WORKFLOW: ✓ The arrangement of interview rooms that are quite separated from each other, but only have one set		

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	of donor scales is an issue ✓ The computer check location is an issue because it does not protect the donor information on the screen ✓ The refreshment area is right next to the testing area, & some distance from the area where donors go after donation to get their certificates – many of the donors then go straight down the stairs & out without going back to the main area for refreshment		
Plateletpheresis	• Machines are set up in advance of the collection but there is no second check immediately before the procedure • There is no trolley to use as a work surface & the top of the machine is used instead • The donor is tested before the donation but no further samples are taken at the time of donation for testing • The test results & procedure log are not linked to the donor by the donation number, only the donor's name & year of birth • A machine log is kept of each procedure, but it is not completed properly, so there is little traceability to machine, Lot numbers, staff etc	• The filling out of plateletpheresis records has improved ✓ Traceability is still poor: ✓ Machine, staff, lot number not linked ✓ Link of donor to donation	
Mobile	✓ Not visited	NOT VISITED	
Processing	• Requirements for use of protective equipment is inconsistent: ✓ Donations are transported to Processing by a staff member who does not change shoes or wear protective clothing except for gloves during segmentation of the tubing. ✓ Other staff working in the area are required to change their shoes & wear coveralls, hairnets, gloves & masks, but there is no change room outside the area ✓ Visitors may access the area without any precautions • There are no Processing rules applied to donations before centrifugation:	• There is now a change room for staff • Staff & visitors are required to wear protective clothing & hairnets when entering the area • The work area is much cleaner, including behind the centrifuges • Flooring has been improved & can now be easily cleaned • Some benches have been resealed but there are still some chips in others • Bag tubing is kept well off the floor • Labelling of satellite bags is performed consistently after centrifugation • Processing steps have been moved from	

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	✓ Transport temperatures & times ✓ Maximum duration of donation time to ensure FFP will be acceptable quality (also important for whole blood platelets) ✓ Check of time since donation for each bag to ensure acceptable quality of FFP (donations from late mobiles are stored overnight in checking area) • The quality of the components cannot be assured because the temperatures of the work areas & the length of time the components sit out at room temperature are not monitored • All information on the primary collection pack is transcribed manually onto the satellite packs by the staff. There is a significant risk of error. • This transcription is not consistently done – some bags are labelled before centrifugation, others are labelled after separation • The expiry date is written onto the red cells but not the FFP • Collection & expiry dates are not always written into the correct place • Blood bags are not always placed on clean surfaces: ✓ Bench surfaces are not in very good condition with many scratches, chips & other damage which prevents adequate cleaning ✓ During run-off into satellite packs, the packs are hung in a way that allows the tubing to drag on the dirty floor • FFP is not weighed for volume, but "150 ml" is handwritten onto them • Processes are inconsistent: ✓ Some of the FFP units visually showed signs of excess red cell contamination ✓ Many of the whole blood derived platelets are variable in volume & show signs of excessive red cell contamination • Flooring is not clean & there are many cracks & holes • There is dust behind the centrifuges	Crossmatch/Distribution back to Processing (washed Red Cells) • Only released platelets are stored in Distribution • There are many issues that have not been addressed: ✓ Old equipment – the blast freezer is in very bad condition ✓ No processing rules are applied (time of donation etc) ✓ There are no expiry dates on FFP ✓ Estimated volumes are written on label, not the true volumes ✓ Donation numbers are written manually onto the blood packs ✓ There is no monitoring of the length of time donations are out on the bench ✓ The reconciliation of donations collected & donations received in Processing is only based on the total numbers of the donations ✓ Records for cleaning for centrifuges are incomplete ✓ A container of "CON" was not adequately labelled. There was no date of preparation, expiry date or signature of staff preparing it. It should be labelled with the full name & details of the solution ✓ Not all staff follow the new rules for changing into protective clothing & some were seen to enter without changing Crossmatch/Distribution: • The component storage equipment issues have not resolved & there is no assurance that the components are being stored at the correct temperatures • Blood refrigerators: ✓ do not have no alarms	

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	• There was no evidence to show that the equipment had been cleaned or checked: ✓ The set of kitchen scales used for balancing centrifuge buckets was extremely old, rusted & dirty ✓ The heat sealers were not clean ✓ The plasma presses are chipped & not clean ✓ The pockets of the rapid freezer were not clean, showed some signs of disintegration, & appeared to have some mould growing • Selected FFP is further manufactured into cryoprecipitate but the packs are not relabelled with the correct component & volume • Some component processing is performed in Crossmatch/Distribution. This is not acceptable because the work area is not set up or equipped as a GMP manufacturing area: ✓ Washed red cells are prepared in an open system ✓ Pooled components (platelets & cryoprecipitate) are prepared using an open system in an old safety cabinet that was not clean, & tubing that hung down into the waste bin ✓ Liquid plasma is transferred into paediatric packs when needed ✓ Routine processing of donations collected after hours ✓ Blood group confirmation after hours • The donation numbers of platelets in a pool are handwritten onto the back of the pooled pack • Blood group confirmation is performed in Processing during work hours & in Crossmatch after hours on a segment taken from each red cell bag: ✓ The grouping is a red cell ABO group only ✓ The reaction wells are not labelled with the segment identification ✓ The results are not recorded & there is no traceability to staff or reagents • The log book of donations processed appears to have	✓ have excess moisture (shows poor seals around doors) ✓ are running at a high temperature • Plasma freezer: ✓ is iced up • Alarms are not checked for refrigerators or freezers • The walk-in cold room is running too warm (15 to 17^{o}C), however it only contains 2 cartons of reagents • The central area (anteroom) between the walk-in cold room & the walk-in freezer room is used to store reagents (syphilis, gel cards) but there are no condensers in the room, and temperatures are not monitored • The freezer room holding the samples: ✓ there is excess moisture leaking out of door ✓ the plastic strips hanging in the doorway are iced up ✓ the door seals are poor ✓ the flooring is badly iced (dangerous)	

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	had a few pages removed. There was no explanation for this. • Some uncontrolled notes are written on the blank sides of the pages in the log book with no explanation		
Mandatory Testing *TTI screening & NAT*	• The benches in the laboratory are chipped & have unsealed joins in the surface, preventing adequate cleaning • Sample centrifuges cannot be cleaned properly because of old labels stuck on them & remnants of old adhesive. The manifold also shows signs of rust • Some of the flooring & work surfaces in the laboratory are unacceptable: ✓ Hole in the floor with exposed electrical wiring ✓ Wooden desk next to the Da Vinci ✓ Badly rusted trolley under the Evolis • There are numerous boxes of reagents etc under benches, preventing adequate cleaning • There is a plant in the laboratory • Cleaning has not been carried out behind equipment & there is loose wiring, dust etc • Cloth towels are used to dry hands after washing. These are not hygienic & should be replaced by paper towels • Samples are delivered to TTI by staff members – the form used to list the samples was not document controlled • The sample quality & integrity cannot be assured: ✓ The sample volumes in the tubes are extremely variable, caused by the placing of pre-printed donation labels over the fill marks on the tubes. ✓ No validation had been performed to show that this variability does not affect the test validity ✓ A number of samples also appeared to be haemolysed to varying degrees • Results are not always recorded after the tests have been completed eg the expected Serodia results for syphilis were pre-printed • Automated spreadsheet tools developed by TTI staff &	• The TTI work area is greatly improved: ✓ The plant has been removed ✓ The boxes under the benches have been removed ✓ The old equipment & rusted trolley have been removed ✓ The hole in the floor has been repaired ✓ Cleaning has been carried out behind equipment ✓ Loose wiring has been bundled up neatly where possible, allowing cleaning to be done properly • There are now records of daily checks on QC & Levey Jennings graphs but staff must remember to sign them • Summaries of test results now clearly show which test system was used • The quality of the blood samples has improved: ✓ the collected volumes are now accurate & are more consistent ✓ the rate of haemolysed samples has dropped drastically - only one or two samples were affected • The storage room for test reagents & dry goods is clean & all items are off the floor to allow easy cleaning • The TTI laboratory still needs some improvement: ✓ there are a few joins on benches & flooring that still need to be resealed ✓ there should be a change room for staff to use before entering the laboratory • New Lot numbers of testing reagents:	• There was no Infection Control in place: ✓ Drinks were kept in reagent refrigerators in work areas ✓ TTI staff do not change out of work gowns etc before going into their staff room to have some refreshments (food & drink) from the refrigerator

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	using donation data entered on computer in Collection have not been validated for accuracy. • Some spreadsheets use the Excel "fill" function to populate the worksheets with numbers instead of entering directly from each tube to make sure any missing numbers are accounted for. • There is no record of daily review of the control charts for TTI serology & no action has been taken for some out-of-range results & trending: ✓ The negative controls for HIV, HCV & the positive control for HCV are running outside the expected ± 1SD range ✓ The positive HIV controls show signs of downward trends while the negative HBsAg is running at the limit of the ± 1SD range • The summary of the test results for the donations does not indicate which test system was used for each donation, eg the columns for HIV, HBV & HCV results are all labelled "Abbott + Roche" • Reactive donations are recorded in a log book for Processing staff to locate & remove the components. The components are held until approval is given for their disposal • The algorithms for managing reactive results are not dated or formally approved. It is suggested they are reviewed & simplified. Repeat testing on the originally reactive screen should be considered • Screening reagents are not all managed appropriately: ✓ Not dated & initialled on opening • The process for verifying results before electronic transfer to computer is not traceable & does not involve clear & consistent approval of the transfer	✓ there is no incoming inspection ✓ new Lot numbers are not adequately verified for acceptable performance before use • Reagents are still not signed & dated when opened • There are 2 reagent refrigerators: ✓ daily checking of the temperature is only performed using the external display – the internal second thermometer is not checked (door locked) ✓ the door hinge is very rusted ✓ samples are stored with reagents Blood Grouping: • ABO & Rh(D) blood grouping on new donors in the donation area: ✓ better controls - one sample tested at a time ✓ test cards linked to daily number on donor form ✓ traceability - staff performing the testing now sign the donor's form ✓ grouping antisera dated when opened • Staff performing grouping on donation segments in Processing sign the bag label as traceability • The process for blood grouping performed on a segment from every blood bag has not been improved: ✓ the donations are tested with anti-A, anti-B & anti-D but no reverse group is performed ✓ there is no record of test results or reagent Lot numbers used ✓ up to 4 bags are tested at one time but reaction wells not labelled to prevent mix-ups	
Component Storage & Handling	• Component quality cannot be assured because of poor handling & storage techniques: ✓ Storage facilities contain a mix of untested (quarantined) & indeterminate components both in Processing & in Crossmatch	• Storage areas/facilities for quarantine (untested) components are now well separated from tested components • Components for re-testing (reactive/indeterminate) are identified & placed into crates for separate	• SUGGESTION: ✓ Label each refrigerator or freezer clearly with its purpose or contents

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	✓ Release labels are not used so there is no visual way of identifying released from quarantine components ✓ Components are checked for test results & if completed & nonreactive, they are then transferred into different refrigerators or taken down to Crossmatch. The time out of storage is not timed eg plasma transferred downstairs took 40 minutes to be checked, moved down & placed back into storage • FFP that could not fit into the 2 chest freezers was stored in a walk-in freezer room that was in an unacceptable condition: ✓ Water had been leaking from a down pipe & frozen into a waist-high mound of ice ✓ The door & plastic curtain had considerable ice hanging from the top in the entrance, suggesting incomplete sealing ✓ Other unknown material was stored in the room • Platelets are not handled appropriately: ✓ The largest platelet rocker is sitting on a wooden table that is smaller than the rocker itself ✓ Platelets are not placed correctly into the rockers. They are stacked on top of each other label side up, preventing good air circulation ✓ The platelet rockers are not clearly marked Quarantine or Released ✓ Release results are written in pen onto the empty plateletpheresis sample bag, but if a sample is taken for QC, the sample pouch is removed & there is no indication left that the test results were acceptable. ✓ The way the results are written onto the pouch is inconsistent between different staff • Reactive donations are identified by TTI for Processing staff to locate & remove. The donations are held until approval is given for their discard. • After approval for discard, the contaminated donations are removed by an external contractor for disposal, but there is no contract with this external contractor, & no	storage • Cleaning is now carried out behind equipment & most previous issues with the condition of the equipment have been addressed • Release labels are still not used to differentiate between released & untested components (very high risk) • Ice should be removed from freezers regularly – some of the freezers show excess ice build-up • Temperature checks using the equipment display & the thermometer inside should both be recorded • The temperature check form needs improvement: ✓ It should be document controlled ✓ It should be linked clearly to the equipment & the location eg by serial number ✓ It should have a field for the acceptable temperature range & the alarm set points to be written	

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	GMP training provided. It is recommended that the container that holds the donations in the cold room until they are collected, should be secured & more clearly labelled as Hazardous.		
Component Release	• There is no standard process for releasing components • There is no formal check that all TTI tests are nonreactive & that the blood group has been confirmed on every donation. It is assumed that once the reactive donations identified by TTI have been removed, the remaining components are nonreactive & can be released. This assumption does not identify any donations that have not been tested in error • There are no records of grouping to check that each donation group has been confirmed. • There are no release labels used to identify released from quarantined components, which both look identical when next to each other. • The process relies heavily on human checks to ensure the release is performed correctly • Platelets are collected by apheresis after the TTI serology has been completed & is nonreactive. The NAT results are only available much later. There is a risk of forgetting that the NAT results are still pending	• The removal of components that are TTI reactive has been improved & it is better controlled: ✓ TTI notify Processing of reactives ✓ the components are identified & moved into a crate in Quarantine storage ✓ when the TTI results have been confirmed, 2 people check the components to ensure the correct ones are removed. These are taken to the discard box on 1st floor • The process for release of non-reactive components has not been improved & is still unsafe: ✓ Individual components are not checked against TTI results or blood group confirmation ✓ After reactive donations have been removed & taken to the discard box, the rest of the components are **assumed** to be non-reactive ✓ These are then moved into the "Release" storage facilities	
Process Control/QC	• Quality Control testing is not performed on all components. Components tested are: ✓ Red cell concentrates ✓ Apheresis platelets • Not all recommended QC tests (international Blood Standards) are performed: ✓ Red cells – haemolysis at expiry & bacterial contamination are not performed ✓ Platelets – pH at expiry is not tested • Samples are sent to the Hospital laboratory for bacterial contamination & cell counts but there is no evidence that the Hospital equipment is capable of counting very low cell counts accurately (red cells & white cells) • Many of the whole blood platelets appeared to have red	• The pot plant has been removed from the laboratory • The temperature in the reagent refrigerator is now monitored • Components are held until testing has been completed • The sampling of apheresis platelets has been improved – the cross-matching details are still retained • The QC program has not been expanded to other components & other tests • Fresh frozen plasma is still not tested for FVIII • Records contain incorrect data – these errors were	• SUGGESTIONS: ✓ Test FFP Factor VIII from frozen segment ✓ Record blood groups for FFP samples ✓ Test platelet pH at expiry ✓ Ensure all apheresis machines are included in sampling & record machine number ✓ Use statistical process control to analyse results ✓ Formal reporting of results

GMP Section	Observations (28/11/16 – 03/12/16)	Progress Assessment (06 & 07/11/17)	New Observations (06 & 07/11/16)
	cell contamination but counts are not performed as part of QC • Components are not held in quarantine until the results are available, so out-of-specification components may end up being sent to hospitals for use • Sampling of platelets from apheresis collections results in the removal of the sample pouch, including the Crossmatch notes confirming that the platelets have been released for use (ie fully tested) • Reagents are stored in a domestic refrigerator that is not monitored • The laboratory has a pot plant in it • Sampling of platelets was performed without gloves	not identified on review • Ongoing monitoring of results for trends etc is not performed • There is no assurance that all apheresis machines are included in sampling program	

GMP Assessment Follow-up Report

National Institute of Haematology & Blood Transfusion (NIHBT)

Reference: APEC Project No. CTI 30 2016A LSIF: *Closing the Gaps in Good Manufacturing Practices Compliance along the Blood Supply Chain in APEC Economies*

Objectives of Visits

Trip 1 (31 October – 05 November 2016)

- Conduct an initial assessment of current practices against the requirements of Good Manufacturing Practice (GMP) to identify gaps in compliance.
- Provide a report of nonconformances to be addressed, with recommendations on corrective actions and prioritisation. (distributed January 2017)
- Provide training in GMP to staff, using the assessment findings as examples.

Trip 2 (30 October – 02 November 2017)

- Conduct a follow-up assessment of progress made in addressing the GMP compliance gaps. NOTE: as the length of the visit did not allow a full assessment of all activities or all gaps, the review focussed on the recommendations and priorities from the first report.
- Provide further training on topics nominated by NIHBT that have caused difficulty in either comprehension or implementation.
- Provide a final report on review findings, including any new nonconformances identified.

Summary of Findings from Follow-up Assessment

Overall, there has been good progress, particularly to the work areas and processes in the Processing area. In most activities where there has been little or no progress, a lack of funding or resourcing has been the main reason. There are a few processes that could be significantly improved at little cost with transfer or relocation to another department, however senior staff appear to be reluctant to consider these suggestions.

There have been some improvements to the quality management system with the development of Change Control and Validation/Qualification Systems, however these are not yet being used. The main roadblock appears to be a lack of understanding on how to apply change control and validation/qualification to Blood Centre activities.

There have been significant improvements in the condition of some of the work areas. The Collection area in the Centre has been refurbished with new flooring and work surfaces, and the area is much cleaner and tidier. The TTI laboratory has removed non-GMP flooring materials (carpet), repaired holes and improved the standard of cleaning under and behind equipment. The Processing area has undergone the greatest level of improvement, with a separate change room, new flooring, new workbenches and good separation between different activities allowing safe workflows. The Storage area is cleaner and tidier, but needs further work and repairs to be GMP-compliant.

A large number of GMP issues were identified at the mobile venue. The mobile was not visited during Trip 1, and the findings from this visit have been listed in the attached report.

Equipment is generally cleaner. The flooring in the Processing cold room has been replaced, however the condition of the Storage cold room needs improvement. Temperature checks are now in place, but other performance monitoring and calibration activities of all critical equipment have not been implemented.

Material storage areas are now temperature monitored but no action has been taken where the temperatures are out of the acceptable range. The cold storage area has been cleaned and tidied, however there has been no improvement in the condition of the other material storage areas. No areas have been allocated for quarantine of incoming materials during inspection and approval, or for rejected materials.

New software has been introduced into the Processing department and has allowed significant improvement to all processes, in particular component release. The Processing department is now well organised and well controlled. However, it is recommended that the department moves to closed processing (pooling) using a sterile connecting device.

Other critical (high risk) processes have not yet been improved. These include control of labels, confirmation of donor blood groups, donor assessment, equipment management, and inspection and approval of incoming materials.

Table 1: Status of Priorities from Trip 1

	Activity	**Status**
1	Component Release (high risk)	Addressed
2	Label Control (high risk)	Not addressed
3	Blood storage equipment (high risk)	Partially addressed
4	Managing Materials (Moderate to high risk)	Not addressed
5	GMP for premises (Low to Moderate)	Mostly addressed (not for Mobile venues)

Further Training/Discussion Topics Delivered

- Validation & Qualification
- Change Control
- Risk Assessment

GMP Assessment Follow-up Report

Centre: National Institute of Haematology & Blood Transfusion (NIHBT) **Dates:** 30 October – 02 November 2017

GMP Section	Observations (31/10/16 – 05/11/16)	Progress Assessment (30/10/17 – 02/11/17)	New Observations (30/10/17 – 02/11/17)	Original Priority / Risk Level
Quality Management	• No change control system in place • No Validation & Qualification system in place	• Change control SOP has been written but is not being used • Validation & Qualification SOP has not been written yet (further training given)		MODERATE
Personnel & Training	• No GMP training for contractors eg waste removers	• NOT ADDRESSED – no action has been taken		LOW
Documentation	• Some documents are not document controlled: ✓ Donor Questionnaire for foreigners	• Document control has been improved – it is now managed by each Department • Donor Questionnaire form for foreigners is now controlled	• Departmental Trainers responsible for training staff – but no plan for the QM to provide document control training to them • New forms such as cleaning records have not been document controlled	HIGH
Records	• Filled out Questionnaire discarded inappropriately "because of error" (not shredded, placed in general waste) • Many records are not filled out correctly: ✓ Missing information ✓ Blank spaces ✓ Mistakes corrected by overwriting or correction fluid ✓ Not filled in at the time of checking eg room temperature for the afternoon written in in advance (several hours earlier) ✓ Action not taken for out-of-range results eg when refrigerator for antisera in donor checking area gave readings of 9º & 10ºC • No records or inadequate records for critical activities: ✓ Service & maintenance of apheresis	• SOP for managing records has been written • Standard of record keeping has improved considerably • Records for many critical activities are now in place • BUT some are still missing or have only been implemented in one or two Departments	• Departmental Trainers responsible for training staff – but no plan for the QM to provide records training to them	HIGH

GMP Section	Observations (31/10/16 – 05/11/16)	Progress Assessment (30/10/17 – 02/11/17)	New Observations (30/10/17 – 02/11/17)	Original Priority / Risk Level
	equipment ✓ Cleaning records (manufacturing areas, work surfaces, storage facilities) ✓ Some records show the results of activities for multiple equipment on one record			
Traceability	• There is no traceability of tests to Lot numbers: ✓ ABO & Rh(D) antisera ✓ HBV rapid test strips • Some temperature checking records were not linked to the relevant equipment or the work area • There is no traceability to staff performing critical steps during collection & processing (initials on the blood bag are not records because the bag is sent to the hospital or discarded as expired) • There is no traceability showing which staff member formally released components (applied release labels)	• Traceability has improved for some activities eg TTI & release labelling • BUT traceability is still poor in most areas		HIGH
Electronic records/data	• The computer system has not been validated	• The computer system is being upgraded & retrospectively validated currently	• There is no Change Plan to cover the upgrades to the software which involve changes to processes etc	MODERATE
Buildings & Premises	• Cleaning of work areas has not included thorough cleaning behind & under equipment, in corners etc & dust & dirt are present • Some areas cannot be thoroughly cleaned because of: ✓ Holes & cracks in floors, walls & ceilings ✓ Use of flooring tiles eg donor collection ✓ Wood used for work surfaces ✓ Cloth sheets on work surfaces (donor assessment) & donor beds ✓ Use of fans, cloth blinds eg in collection ✓ Carpet squares used in TTI ✓ Joins in vinyl flooring not sealed adequately (hole in floor in TTI exposing wiring) • There is no pest control program & flies were	• The Collection area has been significantly improved by new vinyl flooring & workbenches. The standard of cleaning is now much better. • Carpet squares used in the TTI Laboratory area have been removed & the area is now adequately cleaned, including behind & under equipment. • Infection Control is addressing pest control • The Storage department still needs improvement: ✓ there is a significant hole in one of the walls where a pipe enters the wall the pipe is also bound with tape that is very dirty		LOW TO MODERATE

GMP Section	Observations (31/10/16 – 05/11/16)	Progress Assessment (30/10/17 – 02/11/17)	New Observations (30/10/17 – 02/11/17)	Original Priority / Risk Level
	present in apheresis	✓ the benches are chipped & cannot be cleaned adequately ✓ there is no security of access from the public area within the Blood Centre		
Environmental monitoring	• Some work areas have set the acceptable room temperature range at the outer limits of the test methods used eg TTI = acceptable range of room temperature is "15ºC to 30ºC"	• Temperature ranges are now set to 20 – 24ºC		SUGGESTION
Waste management	• Used apheresis sets are discarded into empty blood bag boxes. Although the boxes are lined with yellow biohazard plastic bags, there is no cover to protect staff or donors from potentially contaminated material.	• Replaced by clearly labelled bins		LOW
Equipment Management	• Many items of equipment are not regularly calibrated or checked: • Sphygmomanometer • Donor scales • Hemoscales (automatic blood mixers) • Kitchen scales used in Processing • Thermometers	• A Checklist for calibration & checking of the Hemoscales has been developed • The other listed items of equipment still need calibration & checking protocols		MODERATE TO HIGH
Component Storage Equipment	• Component storage equipment (refrigerators, freezers, walk in cool rooms & freezer rooms) are not cleaned regularly: ✓ Upright freezers & the freezer room are badly iced up, with ice over & around the components ✓ Cool rooms & freezer rooms have rusted patches on floors & shelving ✓ Walk in cool rooms & freezer rooms have numerous cardboard boxes stacked on the floor, preventing cleaning ✓ Rooms with component storage units in them are also used for storage of large amounts of materials (large numbers of boxes), preventing thorough cleaning • There is no evidence to show that the component	• The condition & cleanliness of component storage equipment in Processing has been improved: ✓ The Processing walk-in cold room has new flooring & stainless-steel racks, allowing good cleaning ✓ Boxes etc have been removed from the storage facilities ✓ Although greatly improved, there is still some build-up of ice eg in the Processing plasma freezers • There is now temperature data for the cold room and freezer room in Storage (using dataloggers)	• There is no assurance that the walk-in cold room in Processing performs correctly. The operating temperature is regularly raised from +2 to +6ºC (for red cell storage) to +8ºC to thaw plasma for cryoprecipitate preparation: ✓ Alarm set points are not changed but the alarm does not activate at +8ºC. This shows that the alarm is either not working, or that the setpoint is unacceptable for red cell storage. ✓ No checks are performed when the cold room is adjusted back to +2º to +6ºC or before red cells are stored again. • This practice requires red cells to be moved to other storage.	HIGH

GMP Section	Observations (31/10/16 – 05/11/16)	Progress Assessment (30/10/17 – 02/11/17)	New Observations (30/10/17 – 02/11/17)	Original Priority / Risk Level
	storage equipment is functioning correctly & accurately: ✓ Chart recorders are in place on some equipment but are not used ✓ Not all equipment has two independent temperature probes that enable temperatures to be compared & confirmed ✓ Not all equipment has a temperature display that gives a reading to one decimal point, therefore the accuracy of the temperature cannot be assured ✓ Temperature probes are not lagged in water & therefore only read air temperatures which are not representative of the temperature of components ✓ Temperature mapping has not been carried out & the cold/warm storage spots are not identified ✓ Alarm checks are not performed • The walk-in freezer room, containing clinical FFP with an expiry of 12 months is operating between -18º & -25ºC. It contains clinical FFP with an expiry of 12 months. • The platelet rocker in the apheresis department is not cleaned regularly or calibrated.	• The condition & cleanliness of the component storage equipment in Storage still needs to be improved: ✓ the flooring in the cold room is badly rusted ✓ there is a hole in the wall of the cold room that has been taped up with insulation tape • The condition of the freezer room in Storage needs improvement: ✓ it is iced up ✓ it cannot be cleaned because of the number & volume of its contents ✓ there is moisture on the door flaps suggesting a problem with the door or the seal • Functional checks are still not being performed on storage facilities: ✓ Second temperature checks ✓ Alarm checks • The refrigerator used for storing unreleased red cells in Processing does not have a lagged probe or thermometer in water (lagged) • The storage range for all frozen plasma is still set at -18º to -30ºC (shelf life still 12 months)	NOTE: It is not clear why 8ºC is used to thaw FFP for cryoprecipitate. Council of Europe Guideline states thawing should be "overnight at +2º to +6ºC"	
Material Management	• There are basic specifications for materials, but there is no incoming inspection of the goods against the specification or any formal approval for use • There are no designated areas for Quarantine and Reject goods • There is no traceability to receipt of goods including different deliveries of the same Lot Numbers • Storage areas for material are not tidy, regularly	Three (3) dry storage areas & one (1) cold room were reviewed: • 2 of the dry storage areas: ✓ There has been no improvement in cleaning & tidiness ✓ Temperatures are now monitored but many readings are >25ºC – no action has been taken even though some of the materials must be stored <25ºC (sample tubes)		MODERATE TO HIGH

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	checked, cleaned or monitored for temperature: ✓ Some areas cannot be easily accessed because of boxes & other goods, including waste matter, on the floor ✓ There are expired materials in store eg Fresenius apheresis bags expired 03-2011 & Caridian platelet sets expired 01-06-2013 ✓ Tubing & wiring hanging from the ceiling, trapping dust ✓ Temperature monitoring not always carried out ✓ Some goods have been opened but not dated ✓ Walk in cold room for materials not clean – boxes everywhere, strips of plastic hanging down "to show fan working" ✓ Possible leak from ceiling indicated by rust on walls ✓ Refrigerator for antisera & Architect reagents has an extremely rusted latch • Storage areas also contain large amounts of hospital goods as well as Blood Centre materials eg urine bags • Some reagents that are in use are not labelled with contents eg CuSO4, iodine • Reagents are not dated or signed when opened or when prepared: ✓ ABO & Rh(D) grouping antisera ✓ Blood bags (aluminium foil packets – 15 day expiry)	• The 3rd dry store area has been improved: ✓ It is tidy & clean ✓ It has good temperature control at 20°C to 25°C • The cold room has been significantly improved & is now clean & tidy • There are still no clearly marked, secure areas for: ✓ quarantine of incoming materials ✓ reject materials • There is no traceability to receipt of goods (different shipments of the same Lot number) • Some reagents that are in use are still not labelled with contents eg CuSO4 on mobiles • Reagents are still not dated or signed when opened or when prepared		
Label Control	• There is no control of critical labels (barcoded donation numbers, "Tested" labels, component labels) • Barcoded donation number label placed on primary pack & sample tubes at donor bedside & remaining labels sent through to Processing where they are attached to the satellite bags &	NOT ADDRESSED – no changes made • There is still no label control or reconciliation of label usage • Labelling of satellite bags & segments is still carried out in Processing, with risk of labels being lost, or attaching to other bags • Barcoded donation number labels were	• Barcoded donation numbers left unattended on mobiles	HIGH

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	tubing • Barcoded donation numbers found attached to the inside of centrifuge buckets etc • All barcoded donation numbers on a sheet of labels should be accounted for: ✓ Number used ✓ Number left ✓ Number discarded • Some labels placed straight on backs of red cell packs but there is no evidence that the adhesive is non-toxic to blood	found attached to the inside of crates again (in Storage) – this shows that labels are not adequately controlled		
Donation	• The donor & the questionnaire are separated at several stages during donor selection & collection but positive identification of the donor against questionnaire is not always performed	NOT OBSERVED		HIGH
Donor Assessment	• The medical & risk assessment is not conducted confidentially • Samples for Hb (all donors), rapid group & HBV screen (new & apheresis donors) are collected into EDTA tubes pre-labelled with a sequential number that is also written on the donor's questionnaire. Any pre-numbered but unused EDTA tubes are often taken through to collection for use the next day, however the handwritten number is often still visible after the barcoded donation number is placed onto the tube. • Needles are recapped after collection • The Hb results slip is not securely attached to the donor's questionnaire (a paperclip is used)	• The Hb results slip is now securely attached to the donor's questionnaire • Donor assessment is still not conducted confidentially	• Stamps are used instead of staff signatures (should be original signatures) • Some results are not written onto the donor's form but are shown by a circle around a word – it is not clear what this means • Hb results are only written into a book & not onto the donor's Questionnaire form- suggest they are written on the donor's form to keep all results together with the donor information	MODERATE TO HIGH
Collection	• Large numbers of boxes of blood bags & waste on floor do not allow adequate cleaning • The donor couches are covered with a white sheet of material that cannot be cleaned properly • One single workstation between donor couches is used simultaneously for 2 donors, increasing the risk of mix-ups between donors (paperwork,	• Boxes of blood bags & waste have been removed. • Couches are still covered in material, but the arms of the chairs are left exposed & the plastic cover can now be easily cleaned. • The level of cleanliness of surfaces has improved considerably	• Cleaning records are not detailed eg to show cleaning of donor beds, work benches • Not all records are document controlled • Not all empty spaces have been crossed through if not needed • Equipment has been "bracketed together" on some records for signing – it is not a clear	MODERATE

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	labels) • The duration of the donation is not timed • Donations are not placed on surfaces that have been cleaned daily, eg the stainless-steel trolley was not clean & had bits of old labels still sticking to the surface • Wooden surfaces that cannot be adequately cleaned are used for some manufacturing activities eg heat sealing & stripping of blood bag tubing • There was a small blood spill on the floor & over a set of green kitchen scales that had not been cleaned up • The barcoded donation numbers were not controlled - one barcoded donation number was placed onto the primary pack while the rest were sent through to Processing	• The wooden surfaces have been replaced • The floor tiles have been replaced by coved, sealed vinyl • Paperwork & labels are still not clearly separated when 2 donors are bled at the same time. • Donations are still not timed. • Barcode donation numbers are still not controlled (HIGH RISK)	record of action • Gloves are not changed, or hand disinfectant used, between donors	
Apheresis	• A single work trolley is shared between all donor couches & the apheresis machine itself is used inappropriately as a work surface for paperwork • The barcoded donation numbers are not controlled: ✓ Multiple sets of barcoded numbers are allocated to double & triple platelet collections ✓ Unused barcoded numbers are not discarded but are placed into a plastic tray on the desk without reconciliation • Platelets are kept in the apheresis area until released for use: ✓ The platelets are stacked into the rocker, & some were placed on top of the rocker ✓ The release process is not formal or standard – the yellow labels applied to show they are “quarantined” are removed when testing is complete, but many released platelets still had parts of the yellow labels attached	• Apheresis platelets are now sent to Processing for quarantine & release • The open boxes of waste have been removed. • There are now 3 work trolleys which have reduced (but NOT removed) the risk of mix-ups & errors • Barcoded donation numbers are still not controlled	• Temperature should be monitored at the area where the platelets are held before they are sent up to Processing (the rocker is not inside a temperature controlled cabinet) • Service records for apheresis machines were reviewed: ✓ They have insufficient detail ✓ Some had incorrect dates recorded ✓ Some records were missing eg for the Trima service on 14/09/17	MODERATE TO HIGH

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	• There are open boxes of discarded waste in the area (see comment under "Waste management")			
Mobile	NOT VISITED	• Set-up mobile visited (equipment taken to venue & set up in a hall) GENERAL COMMENTS: • The venue used was large enough to allow a good workflow • Volunteer staff are used but have training & receive ID badges • Donor assessment was performed in private	• Mobile sites are not qualified before the first visit & there is no process for checking the condition of the venue immediately before use • There were several issues with the venue: ✓ There was no air-conditioning ✓ Fans were blowing directly onto donors (contamination of venepuncture site) ✓ There were dusty decorations hanging over donors (contamination of venepuncture site) • The rapid HBV test was not performed according to manufacturer's instructions • Identification of donors was performed well at registration but was not performed again at the bedside • There was no assurance that blood bags would be used within the required timeframe: • Foil packets of blood bags were not dated & signed when opened - the bags were removed from the foil packet & left loose • The environmental temperature was not monitored where the blood bags were stored • There is a high risk of contamination from poor handling of the blood bags: • The blood bags were not always placed on clean surfaces • Donors are given their own bags to hold before donation – some were seen placed on dirty surfaces • Donations were not mixed consistently (no automated mixers) • Stripping was not performed at the donor	

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			bedside (this delay in stripping can cause clotting in the tubing) • Barcoded donation numbers were not controlled – the roll of numbers was left unattended on a table • Packing of blood in transport containers needs to be validated (staff must make sure there is no direct contact with ice packs)	
Processing	• Gown & shoe requirements for entering Processing are not consistent. Staff & visitors are required to change shoes & put on gowns in a gowning room outside, but staff from the Collection area who are delivering collected blood can enter Processing without changing & with a dirty trolley • Bench surfaces are in poor condition preventing adequate cleaning • The method of attaching barcoded donation numbers to satellite packs is not standard – some are attached before centrifugation, some after centrifugation/separation • There are no Processing rules applied to donations before centrifugation: ✓ Transport temperatures & times ✓ Maximum duration of donation time to ensure FFP will be acceptable quality (also important for whole blood platelets) ✓ Check of time since donation for each bag to ensure acceptable quality of FFP (donations from late mobiles are stored overnight in checking area) • Expiry dates are stamped into the incorrect place on some pack labels • Volumes written on bags are not actual volumes • Open processing is used for pooling – the technique appears satisfactory & the expiry date is changed appropriately, however there is no validation to confirm the practice is acceptable	• Processing has undergone extensive renovations & installed new software that has significantly improved work practices. • The work area is now secure & cannot be accessed easily by unauthorised persons • There is new vinyl flooring which is well-sealed, with coving at the wall joins • New work benches have been installed • The walk-in cold room has new flooring & stainless-steel racks, allowing good cleaning • There is a very good one-way work flow now • Push-button glass doors between work areas separate activities: ✓ change room & receiving room ✓ receiving room & centrifuge room ✓ centrifuge room & separation room ✓ separation room & labelling room ✓ separation room & “document” room • There is a new well-designed change room & all persons entering the Department must gown up. • Receipt & labelling are now consistently performed in one room before processing • The number of donations “sent & received” are checked • Donations are entered onto computer & reconciled with samples • The new computer software provides good	• “Slow bleed” donations are now marked with tape but: ✓ the only information from the tape is that the collection was >10 minutes – it could have been 12, 15 or as much as 20 minutes ✓ these donations are not made into platelets, but can be made into transfusible RC & plasma (COE limit for FFP is 15 minutes) • Some tubing was allowed to touch the floor	HIGH

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	• FFP is frozen in freezers because the rapid freezer was not working, but there is no validation to show the levels of FVIII are acceptable • "Released" labels are attached to components before testing is complete (see Component Release) • Stored components include a mixture of components labelled with "Released" & components with no labels on them	control & donation numbers cannot be entered twice • The centrifuge room is clean & tidy • The separation area is also clean & tidy with a good workflow • The actual component volumes are written onto bags • There is a blast freezer in place, but it has not yet been validated (discussion) - plasma is transferred to the Storage Department for freezing in the blast freezer there • Released labels are no longer placed onto components before testing & the release function is computer controlled • All equipment is clean, including heat sealers • There is clear separation of "unreleased" from "released" components during storage & handling • Records of cleaning & temperature checks are available • Open processing is not yet validated.		
Mandatory Testing *TTI screening & ABO & Rh(D) Grouping*	• The testing laboratory is certified to ISO 15189 & processes are generally good & well organised. • Samples are split between Abbott Architect & Cobas systems for viral serology but there is no evidence of performance comparisons • Security to the laboratory could be improved as anyone could walk in • Areas between the testing equipment are not regularly cleaned & dust etc was present • There was a hole in the floor exposing electrical wiring • Joins in the vinyl flooring were not sealed, preventing adequate cleaning • Squares of carpeting was placed in front of the doors into the NAT room. Carpet is not an	• There is now data comparing the performances of the Architect & Cobas systems to show that their performances are comparable • Areas between equipment are now cleaned regularly despite the difficulties of excessive wiring lying across floors • Holes & poor joins in the vinyl flooring have been adequately repaired • Carpet squares have been removed to allow better cleaning • QC testing is performed & reviewed regularly • Incoming inspection of new materials is carried out before use:	• The new Roche NAT system has been installed but "not validated" • On review: ✓ Roche has supplied good IQ & OQ reports ✓ Performance of the system has been assessed by staff ✓ The work is sufficient for the system to be considered "validated" • BUT need: ✓ To ensure all Roche reports are checked & signed (by Roche & by customer) ✓ Confirmation that all Roche	LOW

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	acceptable flooring material for laboratories	✓ Physical inspection & count ✓ Performance verified for new Lot Numbers of test reagents • Documentation is very good • SUGGESTION: use coloured labels to differentiate between new materials waiting for inspection & verification and materials that have been approved & can be used	recommendations have been met ✓ A summary report of activities & outcomes ✓ Conclusion & formal approval to use	
Component Storage & Handling	• There are 2 areas where components are held in Quarantine before being sent to Storage after release - in Processing & the platelet rocker in Apheresis. Release & quarantine areas are designated but contain a mix of release labelled/unlabelled units (in Processing) • Platelets kept in apheresis have yellow stickers on tubing to indicate "quarantine". These are removed when TTI testing is finished but not completely • Platelets are not placed correctly into the rockers. They are stacked on top of each other, label side upwards, preventing good air circulation. In some cases, they are not rocked • ABO & Rh(D) screening on red cell segments is performed in the Storage area as confirmation of blood groups: ✓ 3 people are involved in this activity but there is no clear traceability or record of the test results ✓ Confirmation of blood grouping is only performed on red cells ✓ The segments removed from the bags are not labelled - 5 taken off at a time • Plasma storage at -18ºC to -25ºC meets the Government Decree but there is no evidence that FVIII levels are still acceptable at 12 months (NOTE: Council of Europe sets an expiry of 3 months for storage at this temperature range)	• Apheresis platelets are no longer labelled with yellow stickers but are sent to Processing for quarantine until testing has been completed & then release labelled in Processing • Release labelled & unlabelled components are now kept separate • The arrangement of platelets on the rockers has been improved but the Apheresis department needs to be more careful not to stack them STORAGE: • The Storage Department opens onto the street but security of access from outside is good • Labelled components received from Processing are now checked & reconciled: ✓ by Storage staff & Processing staff (paper records) ✓ by entry onto computer ✓ against the "batch number form" • The premises are cleaner but need more improvement to meet GMP requirements • Crates are now cleaned every week • There is data for temperatures in the cold room & the freezer room (using datalogger) • There has been little change to the	• Components that are waiting for grouping are kept either in the laboratory or in the cold room but are identified only by the loose "batch number form" & the position on the floor. The use of the "batch number form" is an improvement but: ✓ it is a Quality record but is not document controlled ✓ it is a loose form & can easily be misplaced. Suggest review eg each crate marked permanently with a number that can be used to link the crate to the relevant "batch number form" • The crates are cleaned weekly, but several had barcoded donation numbers that had become stuck to the sides • Premises need improvement: ✓ there is a significant hole in one of the walls where a pipe enters the wall the pipe is also bound with tape that is very dirty ✓ the benches are chipped & cannot be cleaned adequately ✓ there is no security of access from the public area within the Blood Centre • The heat sealer used to seal & separate apheresis platelet packs did not appear clean	MODERATE

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		confirmation of ABO grouping on bags: ✓ Only 1 type of blood group is tested but still 5 unlabelled segments at a time ✓ Rh(D) grouping is not tested ✓ The "batch number form" is signed as each batch is tested but there is still no reliable record of the results (eg on computer) or traceability to staff or reagents • Reagents are dated when opened	• Tubing from the components was allowed to hang on the floor (contamination risk) • Processing steps are carried out in Storage even though the Department does not have the same level of GMP compliance as Processing: ✓ Rapid freezing of plasma including FFP (critical step) ✓ Sealing & separation of apheresis platelet packs	
Component Release	• There is no standard formal procedure for releasing components after mandatory testing has been completed • "Released" labels are applied to many components before they have been tested (placed on after serology but before NAT) • Components are not individually checked against ABO Rh(D), TTI & NAT screening results before the "Released" labels are applied. • "Released" labels do not reference ABO grouping, & there is no indication on each bag that the group has been confirmed • There is no traceability to the application of the "Released" labels	• There is now a formal release procedure & new software to control component release (labelling) • The software ensures checking of component status before printing of release labels: ✓ TTI & NAT tests checked (non-reactive) ✓ ABO Group performed & no irregular antibodies identified ✓ Syphilis screen negative • Labelling with release label: ✓ release labels are printed on demand by the computer ✓ labels contain collection & expiry dates, blood group & TTI details • The new workflow for release labelling workflow is very good & minimises risks of errors: ✓ one bag is checked & labelled at a time ✓ the workflow is one way ✓ "reactive" or "not tested" components are flagged & removed immediately from the bench to a red crate for further investigation • Traceability to the application of the release labels is provided by computer log-in	• There is no software check at release labelling that the ABO & Rh(D) group of new donors has been confirmed by a second check: ✓ all ABO groups are checked in Storage ✓ Rh(D) groups are not checked ✓ results are not recorded on computer so there is no assurance that every new donor has been checked • Suggestion for labelling – place the release label onto the component in a way that does not cover the blood bag Lot Number (in case of problems or recalls)	HIGH

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		• There is good traceability to batches of 4 platelets • After labelling, components are recorded on computer & taken straight to Storage		
Process Control/QC	• Quality Control testing is only performed on: ✓ FFP ✓ Whole blood (small number weighed for volume) • Components selected for QC are not held until the results are ready.	• The QC program has been extended to include other components & the results are looking good • Clear component specifications have been developed • Components are still not held until QC testing is complete	• The sampling plan is based on random selection but does not ensure that samples are taken from all collection areas (Centre & mobiles) or equipment used (centrifuges, apheresis machines) • Platelet pH is tested at Day 1 not at expiry • SUGGESTIONS: ✓ Test FFP Factor VIII from frozen segments (more representative of the final component) ✓ Record blood groups for FFP samples (FVIII levels vary in different blood groups) ✓ Ensure all apheresis machines are included in sampling & record machine number ✓ Use statistical process control to analyse results ✓ Report results formally to Management	HIGH