## Blood Safety Information System | DONOR MANAGEMENT

The effective management of information related to the collection, screening, distribution and use of safe blood products is a critical element for all Blood Services. The Blood Safety Information System (BSIS) is an open source web-based information system designed to manage donors and blood safety information from the point of donation, through to laboratory testing, component processing and labelling, storage, issue and transfer to hospital and clinics. The BSIS tool is primarily targeted for deployment in resource-limited countries.

The BSIS version 0.9 (Donor Management) is a sub-set of the full BSIS functionality, focused on managing donors and related donation information. It can be deployed as a working system that focuses on collecting and storing data about donors and donations and providing selected management reports. It is intended as a first step to implementing a full BECS, as part of a phased roll-out, making it as easier for the blood service staff to transition from a manual or partly-computerised system to a fully computerised solution. BSIS v 0.9 is highly configurable and provides comprehensive role-based access.

The main functional areas covered by BSIS version 0.9 are:

* Donor management
	+ The user will be able to register a new donor, lookup new donors, print donor barcode labels, and view select information about the donor. The user will be able to defer the donor and the system will also check criteria to see if the donor is eligible to donate.
	+ It also enables the user to list donors that require counselling and to record the post-donation counselling status.
* Donation management
	+ The user will be able to open a donation batch for a clinic and add donations to that batch, using the pre-printed Donation Identification Number (DIN) to uniquely identify the donation. Pre-printed DIN labels are a pre-requisite for the system.
	+ The user will be able to link a donor to a donation. Data related to that donation can be recorded i.e. donor assessment data (Hb, blood pressure, weight) and date and time bled.
	+ The user will be able to print a list of donors due to donate, filtered according to donor panel, blood group and previous donation dates.
	+ Record manipulation rules governing donor record updates and deletions implemented for traceability purposes
* Record the test outcomes for each donation
	+ The user will be able to record the blood grouping test outcomes for ABO Rh testing and will be able to record the test outcomes from the Transfusion Transmissable Infections (TTI) screening process. Unsafe donations will be flagged and donor records will be updated accordingly.
	+ Limited test batch process functionality
	+ The test rules are configurable i.e. which tests are mandatory, confirmatory testing rules.
* Configuration and system administration – BSIS version 0.9 is highly configurable, enabling parameters to be configured to meet local requirements. These include the ability to define deferral reasons, donor panels, date formats and the minimum period between donations. The system also provides for the set-up of users and associated roles to manage access to the system, as well as account setup and recovery for user passwords. Authorised users can also view the audit log.
* Management reports related to donors and donations.

BSIS version 0.9 (Donor Management) does NOT include:

* Component processing
* Labelling of components
* Discard management
* Comprehensive test batch functionality
* Inventory (Blood bank stock control)
* Synchronisation of data between laptops and the central database for mobile clinic use

These features will be included in the BSIS version 1.0 (Laboratory Management) due for release in early 2016.

### BSIS v0.9 Donor Management core features

* Use of barcode scanners and barcode label printers for donor and donation identification to streamline data entry and reduce data entry errors
* Use of a system-generated number to uniquely identify donors. The format of the donor number is configurable during the initial set up of the application.
* A series of system control points to manage the eligibility of donors to donate.
* Use of a pre-printed DIN number to uniquely identify donations
* Linkage of donor record to donations
* Recording of test outcomes from the serology and TTI testing processes
* Flagging/blocking of donor and donations as unsafe according to defined rules
* Pre-defined management reports for donor and donations available within the system
* Comprehensive role-based access.
* All system activity is logged and auditable and viewable by authorised users.
* Configurable via system-administrator defined parameters
* Supports AfSBT accreditation and recommended best practice

### BSIS Set-up and Requirements

BSIS is designed to operate using a client-server architecture, making use of a dedicated high-spec server to host the BSIS application on a web server hosted in a local or wide area network. Clients access the application over a web-browser. The system is operating system independent, and can run on any workstation with access to a modern web browser and Java installed, although the recommended setup is to use an open-source Ubuntu server to host the application, and the free Chrome web browser to access the application. The system makes use of a MySQL database, and requires MySQL to be installed on the server.

The application is also designed to be used with additional hardware that requires barcode printers and scanners, and Zebra barcode and pack label printers. Pre-printed Donation Identification Numbers DIN labels are also a pre-requisite.

### Acknowledgements

The BSIS software is a refined, production ready extension of the V2V tool created as a research and development project at the Georgia Institute of Technology’s College of Computing, with the support of the U.S. Centers for Disease Control and Prevention (CDC). Since 2013 Jembi Health Systems has enhanced and refined the original V2V tool, now known as BSIS, and is in the process of enhancing, testing and validating the software though both internal and external validation processes. BSIS version 1.0 will be ready to be implemented and supported in early 2016. Jembi Health System’s work with BSIS is funded by the U.S. Centers for Disease Control and Prevention (CDC) and PEPFAR.