Annex (A)
Non-Functional Requirements

1. **Workflow based operations**

A workflow is activated when an initiating event occurs. The workflow would guide a user in actioning an event. It would define the requirements to initiate a workflow. Once initiated, the processing should be controlled as to the sequence of activities, and the officers who execute it.
Some key terms and concepts of workflow based operations are:

- Task: Work performed to effect a single change. A workflow would consist of several tasks. In workflow construction, the task definition is a template for action. The task must be associated with an actual event in order to carry out the action.
- Activated Task: When an action is required, and a task is associated with a specific item which must be actioned, the task is instantiated and a single instance of the task is created. It is the instance of a task (ie- Activated Task) which can be executed. (Note: This is not a standard workflow term, and has been adopted for clarity).
- Work Item: A workflow-item moving through a work process. A work item would be associated with a single instance of a workflow, and Activated Tasks within the workflow.

Refer Annexure A1.1 for more supporting services

2. **Security**

1. User authentication and authorization

An administrative application need to be developed wherever applicable.

2. Availability

The system should be developed to ensure "High Availability" to remain the system available all the time. (e.g. Portlets clustering capability should be taken into consideration in the development)

3. Non-repudiation

The system should ensure non-repudiation by having standard audit-trails and provisions to have WS-Security using digital signatures.

3. **Audit Facilities**

Wherever applicable, an audit trail of all activities must be maintained. On a service or operation being initiated, the system should log the event, creating a basic 'audit log entry'. It should not be possible for the operation to be executed without the log entry being made.

The information recorded in the audit trail depends on the type of activity which takes place. Each service would be responsible for logging detailed information. The different types of operations are -

1. Data Capture & Maintenance
2. Creation of an entry / item
3. Modification an item
4. Deletion
5. Control (or status change)
6. Process execution

7. Data synchronization
8. Print (only selected item)
9. Retrieval
10. Monitor

Detail logging may be enabled or disabled for each type of operation, and/or for each business object. It should be possible to configure which attributes of a data item should be traced at the detail level. Tracing of some attributes may be considered mandatory, and they should not be turned off.

4. **Backup and Contingency Planning**

The main contingencies that should be considered and the training with regards to these shall be given to the relevant staff -

1. Equipment failure
2. Physical / natural Disaster
3. Messaging or communication facilities.
4. Changes in operations and policy
5. Sudden absence of key personnel
6. Breach in Security

Automatic Backups daily, weekly and monthly should be taken. All the backup procedures and backups needs to be tested regularly for restoration.

5. **Performance**

Following performance criteria is provided as a guideline only. If the actual performance is falling below the stipulated figures, the consultant is to justify the reasons. However, the performance level must be accepted by the technical evaluation committee appointed by the client.

The bandwidth is assumed at 512kbps (shared) (point to point between LIX and the Department web service) with 1,000 concurrent users (50% load factor) in total.

Item	**Performance**
Screen Navigation: field-to-field	< 10 milliseconds
Screen Navigation: screen-to-screen	< 5 seconds
Screen Refresh	< 3 seconds
Screen list box, combo box	< 3 seconds
Screen grid – 25 rows, 10 columns	< 5 seconds
Report preview – (all reports) – initial page view (if asynchronous)	< 60 seconds in most instances. It is understood that complicated / large volume reports may require a longer period
Simple enquiry – single table, 5 fields, 3 conditions – without screen rendering	< 5 seconds for 100,000 rows
Complex enquiry – multiple joined table (5), 10 fields, 3 conditions – without screen rendering	< 8 seconds for 100,000 rows
Server side validations / computations	< 10 milliseconds
Client side validations / computations	< 1 millisecond
Batch processing (if any) per 100 records	< 120 seconds
Login, authentication, and verification	< 3 seconds
Daily backups (@ Dept.) – max duration	1 hour (on-line preferred)
Total Restore (@Dept) – max duration	4 hours