

CHAPTER 3

MINISTRY OF CHEMICALS AND FERTILISERS

DEPARTMENT OF FERTILISERS

IT audit of Concession Scheme Information System

Highlights

Deficient User Requirement Specification, Software Requirement Specification, documentation, testing, implementation, review and change management of the computerised Concession Scheme Information System for regulating the concession to the manufacturers and importers on the sale of decontrolled fertilisers entailed risk of unauthorized working practices and depressed the reliability and usefulness of the Information Technology System.

Absence of formal security policy and procedures in the IT system rendered the system insecure with shared passwords, non-maintenance of log files and non-existent accountability for data entry and consequential decisions on payment of concession.

The programme lacks many important features that are essential for risk-free management of the Concession Scheme. The system permits duplicate diary numbers for the same case, allows changes to be made in the database, including payment details, at any point of time and proceeds further even with blank fields or without adopting essential data from the previous modules. The system does not contain validation checks, or master data tables for the rates determined by the Department for uniform application to all cases and depends on manual entry every time, which is prone to errors and consequential incorrect payments of concession.

Sample checks disclosed unrecovered concession aggregating Rs 48.96 crore from the manufacturers/importers due to revision of the base rates for a quarter after the 'on account' payments relevant for that quarter, unsettled 'on account payment' aggregating Rs 2,028.22 crore with reference to certificate of actual sale by the state governments, and unrecovered amount of Rs 57.41 crore. All of these were attributable to deficient input controls and inadequate risk controls in the software and deficient internal controls in administration of the programme.

Separate software with different database structures for two wings, which were implementing the Concession Scheme for indigenous and imported fertilisers, resulted in compromise in their ability to provide a platform for consolidated reporting.

List of recommendations

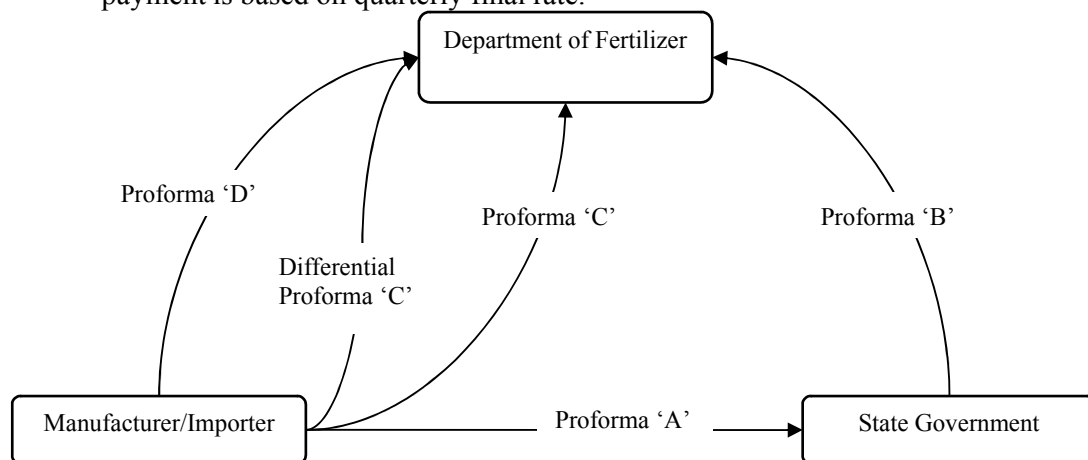
- ↘ *The Department may review the User Requirement Specification and Software Requirement Specification of the system to incorporate all essential and desirable features to turn it into a comprehensive system.*
- ↘ *Steps should be taken to incorporate the requisite details in the existing documents and construct the non-existent ones. Further, the Department may lay down documentation policy and devise suitable procedures to ensure that amendments to the programmes are carried out only after proper authorization, documentation and testing.*
- ↘ *The Department should aim at integrating the IT system for the entire scheme on the same software with linked data fields, where required.*
- ↘ *A unique user ID and password with module level security, provision for change of user ID and password after specified time, invalidation of the user ID and/or password after specified period, regular generation and maintenance of log files for monitoring of the system and putting restriction on number of login attempts for different classes of users may be incorporated in the system. While National Informatics Centre can provide support to users, it will be a good practice for the Department to own and administer the system with proper training.*
- ↘ *The Department may review the system to provide for mandatory fields, auto-control of blank or incorrect/duplicate data entry, single unique diary number to all cases, master data and automatic transfer of data to the later Proformae with a view to ensuring accurate and authentic processing of the various stages of concession scheme.*
- ↘ *The fields related to payment should be made mandatory. Further, the report of expenditure on concession should then be based on the date of cheque and not the month of claim.*
- ↘ *Necessary control features should be incorporated in the software to prompt the user in case of pending recoveries.*

3.1 Introduction to the Concession Scheme

With a view to ensuring availability of decontrolled fertilisers at reasonable prices, the Union Government introduced a scheme of concession on sale of decontrolled fertilisers in 1992-93. From 01 October 2000, the responsibility of administration of the scheme was transferred from the Department of Agriculture and Cooperation to the Department of Fertilisers. During the period 2001-04, the Department released Rs 11,054.04 crore as concession to the manufacturers/importers of fertilisers under the scheme.

3.1.1 Salient features of the Scheme

- The Department indicates Maximum Retail Price (MRP) for Di-Ammonium Phosphate (DAP), Muriate of Potash (MOP) and each of the complex grade fertilisers, whereas in the case of Single Super Phosphate (SSP), the respective state governments/Union Territory governments announce the indicative MRP.
- In order to avail of concession under the scheme, the manufactures/importers are required to sell the decontrolled fertilisers at the applicable MRP. The Department notifies the base rate for the year as well as rate of concession on quarterly basis for each fertilizer, except for SSP. For SSP, the Department notifies rate of concession annually.
- The payments made under the scheme include ‘on account’ payment of concession (claimed in Proforma ‘C’) at 85 *per cent* of the admissible amount to the manufacturers and 80 *per cent* to the importers. The manufacturers are allowed 90 *per cent* ‘on account’ payment provided they submit bank guarantee. The balance payment (claimed in Proforma ‘D’) is released after the state governments certify the quantity sold (in Proforma ‘B’).
- ‘On account’ payment is made with reference to applicable base rate. The company is also allowed differential payment with reference to base rate and final rate announced for the quarter, while balance payment is based on quarterly final rate.



Proforma 'A' – submitted by the manufacturer/importer to the state government showing the details of sales made. A copy is also forwarded to the Department of Fertilizer.

Proforma 'B' – sent by the concerned state government to the Department after verifying the quantity sold by the manufacturer/importer as claimed in Proforma 'A'.

Proforma 'C' – submitted by the manufacturer/importer to claim 'on account' payment of concession on base rate.

Differential Proforma 'C' – submitted by the manufacturer/importer to claim the differential payment on declaration of quarterly rates if these are more than the base rates.

Proforma 'D' – submitted by the manufacturer/importer to claim the balance payment on the basis of final rate.

3.2 Objectives, scope and methodology.

This IT audit was conducted to assess the system development, testing, implementation and the effectiveness of computerisation of the concession scheme through introduction of computerised Concession Scheme Information System (CSIS) for monitoring the concession provided by the Department to the manufacturers/importers of decontrolled fertilisers.

The review, covering the period April 2001 to March 2004, was conducted during April to August 2004 in the Department. It covered examination of internal controls, for which the CSIS was evaluated comprehensively to assess the control mechanism for valid data entry and correct processing required for effective monitoring of the concessions provided by the Department.

A walk through test was used for understanding the system, whereafter entire data pertaining to the CSIS was imported into *MS Access* and analysed.

3.3 Concession Scheme Information System

CSIS was developed by National Informatics Centre (NIC) on *SQL Server 7.0, Active Server Pages* with *Crystal Reports* and implemented in December 2001 to provide information support for monitoring various activities pertaining to the scheme. The broad objectives of the CSIS were to monitor payments; 'on account', 'differential' and 'balance' payments under the concession scheme and verification of "certificate of sale" provided by the state governments.

3.3.1 A walkthrough of the CSIS

CSIS consists of three main modules: (i) Masters Data Entry, (ii) Bills Data Entry and (iii) Reports Generation. Masters Data Entry consists of three main sub-modules, namely, State Master, Product Master and Company Master containing codes, names and other pertinent details of states, products and fertiliser companies, respectively.

Bills Data Entry consists of four main sub-modules, namely, Proforma 'B', Proforma 'C', Differential Proforma 'C' and Proforma 'D' for data entry pertaining to the respective proforma.

The claims submitted by the manufacturers/importers in Proforma 'C', consist of various important details like 'year', 'month', 'company', 'state' and 'product' (these five fields make a *primary key* for unique identification of a record), 'base rate', 'quantity sold during the month', 'quantity returned in the previous month', 'amount to be paid', etc. The details of this claim are entered in the sub-module Proforma 'C', which generates a unique diary number. The sub-module of the programme automatically calculates the 'total payment due' and 'payment to be made' (80 *per cent*, 85 *per cent* or 90 *per cent* as specified in the Company directory) from the 'base rate', 'quantity sold' and 'quantity returned during the pervious month'.

In case the quarterly rate announced by the government is more than the base rate, the manufacturers/importers can claim the differential payment, the details of which are entered in the sub-module Differential Proforma 'C'. The manufacturers/importers claim balance payment of the concession in Proforma 'D'. The details of a claim are entered in the sub-module Proforma 'D' which stores, besides the primary key, other details like 'final quantity', 'final rate of concession', 'payment already made', 'total payment due', 'balance payment to be made', etc. Since balance payment can only be made after the concerned state government sends the 'Certificate of Sales' in Proforma 'B', the data entry in sub-module Proforma 'D' can be done only in respect of manufacturers/importers whose Proforma 'B' has been entered in the system. Proforma 'B' stores, besides the primary key, 'quantity' as certified by the state governments.

For each sub-module, the system generates internal noting for approval of the case by the competent authority. After approval, it also generates sanction order for the Pay and Accounts Officer. The Pay and Accounts Officer makes the payment to the manufacturers/importers and sends the payment details like 'cheque number', 'cheque date', 'cheque amount', etc. to the Department. Entering of these details in the CSIS marks the conclusion of the claim initiated by the data entry of Proforma 'C'.

The third module 'Report Generation' produces various reports from the system including internal noting and sanctions.

3.4 Audit findings

Various shortcomings noticed in the development, testing, implementation and monitoring of the CSIS are discussed in the succeeding paragraphs.

3.4.1 Deficient User Requirement Specification and Software Requirement Specification

The *User Requirement Specification (URS)* and *Software Requirement Specification (SRS)* were not properly laid down before the development of the 'Application'. As a result, the 'Application' lacked various desirable features, as discussed below:

3.4.2 The manufacturers of fertilisers eligible for 85 *per cent* 'on account' payment, are allowed to claim 90 *per cent* 'on account' payment on submission

of bank guarantee equivalent to the balance five *per cent* of the concession amount covered under the scheme. The bank guarantee is required to be furnished on or before 01 April of the relevant financial year during which the concerned manufacturer intends to avail of the facility of 90 *per cent* 'on account' payment. As per the scheme guidelines, after the deadline of 01 April, option for availing 90 *per cent* 'on account' payment with bank guarantee is not available for the relevant financial year. However, the system allowed the users to interchange the option percentage even after the deadline. The system did not have provision for entering details of bank guarantee. The system was thus, not consistent with the administrative instructions issued by the Department.

3.4.3 Importers notified under the Concession Scheme for decontrolled fertilisers, who were importing these fertilisers at least for the immediate preceding two years are eligible for 80 *per cent* 'on account' payment. However, the period of two years could be relaxed on case to case basis if the importer was willing to offer bank guarantee against 100 *per cent* payment of the claim under the scheme. The balance 20 *per cent* was to be released on certification of sale by the state governments. On the other hand, any occasional importer of decontrolled fertilisers, after induction, would receive full payment only after certification of sales by the state government. The system lacked a provision for maintaining details of notified/occasional importers and bank guarantee, with the attendant risk of 'on account' payment even to the occasional importer.

3.4.4 The claimants eligible and desirous of drawing 'on account' payment are required to give details of sales including the names and addresses of dealers/retailers with product-wise quantities sold in Proforma 'A'. However, there was no provision for entering the details of Proforma 'A' in the system. Absence of this feature deprived the Department of an important database for monitoring sales of the companies.

3.4.5 In case of SSP, concession under the scheme is available only to those manufacturers who are subjected to 'first time' audit/inspection by Technical Audit and Inspection Cell of the Department and six monthly thereafter. In addition, manufacturers of SSP have to submit monthly information on raw material purchased from notified sources and used in Proforma 'E'. The system lacked provision for storage of information about the companies which have undergone technical audit/inspection and have submitted Proforma 'E'. Data analysis revealed that in 638 cases, 'on account' payment of Rs 53.42 crore was released to the manufacturers for sales made between August 2002 and March 2004, though in all these cases the date of technical audit/inspection was later than the date of the claim. Thus, payments in these cases were made without ascertaining whether the claimants had used only specified grades of rock phosphate purchased from notified sources or not.

3.4.6 Manufacturers/importers are eligible for availing of payments of concession under the scheme only if they are enlisted with the Department. The system lacked the feature of enlisting or delisting of manufacturers/importers. Further, it also lacked the feature of withholding of

payment to specific manufacturers/importers or blacklisting or disqualifying or debarring them.

Recommendation

- ⇄ **The Department may review the URS and SRS of the system to incorporate all essential and desirable features to turn it into a comprehensive system.**

3.5 Deficient documentation and programme amendment controls

The documentation of the development of CSIS, *testing*, implementation and review was deficient. The SRS was not framed correctly since it did not contain specific requirements. The Department amended the CSIS several times informally and no documentation regarding amendments made to the original application software was available. Inadequate documentation increases the risk of unauthorised working practices being adopted and may render the systems difficult to correct, improve and maintain. Non-updation of documentation may leave the users ignorant of the changes made in the application and may lead to incorrect data entry and processing resulting in unreliable reports, unfit for use.

Recommendation

- ⇄ **The Department may take steps to incorporate the requisite details in the existing documents and construct the non-existent ones. Further, the Department may lay down documentation policy and devise suitable procedures to ensure that amendments to the programmes are carried out only after proper authorisation, documentation and testing.**

3.6 Different software and database

Two wings of the Department implemented the Concession Scheme, i.e. Indigenous and Imported wings. Separate softwares with different database structures were developed for these wings. As a result, it was not possible to generate a consolidated report from the system. Any required information has to be generated from both the applications and then merged manually, which is inefficient management of information system by the Department.

Recommendation

- ⇄ **The Department should aim at integrating the IT system for the entire scheme on the same software with linked data fields, where required.**

3.7 Lack of security

3.7.1 User level security was implemented by issuing general passwords to the users, including to supervisory staff of the Department. However, the module level security was not implemented. Thus, any user logged on to the

system could perform any of the functions like data entry, editing, deletion, etc. This entailed risk of diluted accountability as shared passwords make tracing of activities to a specific user difficult.

3.7.2 Further, the system did not incorporate change of user passwords and invalidation of this password/username after a specified period. In case of need, the NIC would only change the user name or password. This resulted in all the passwords including the administrator passwords remaining with NIC. Further, the administrative rights of the system also remained with NIC and therefore, no official of the Department was responsible for the security of the system and data. Thus, in the event of any problem, no official of the Ministry could be held accountable.

3.7.3 In order to maintain the security of a system during ongoing operations, it is essential to monitor the system against configuration errors, security loopholes, security breaches by users and attacks on the system. This can be achieved only with the help of log files. Neither were the log files generated nor was any other methodology adopted for monitoring the users' activities.

3.7.4 Restricting the number of failed login attempts is an accepted industry standard for logical security. The system did not restrict the login attempts. Provision of unrestricted login attempts entails an inherent risk of an unauthorised user logging on to the system with a guessed password.

Recommendation

⇕ **A unique user ID and password with module level security, provision for change of user ID and password after specified time, invalidation of the user ID and/or password after specified period, regular generation and maintenance of log files for monitoring of the system and putting restriction on number of login attempts for different classes of users may be incorporated in the system. While NIC can provide support to users, it will be a good practice for the Department to own and administer the system with proper training.**

3.8 Deficient internal controls

Deficient internal controls have rendered the CSIS unreliable, which impairs its use for decision making purposes as discussed below.

3.8.1 No provision for linking of diary numbers across the sub-modules

The CSIS generates a unique auto incrementing diary number for each claim entered into the system. The Department used different series of diary numbers for each sub-module and there was no link between the diary numbers across the sub-modules. Besides being an inefficient way of querying the database, since it deprived the user of making queries across the sub-modules on the entire database this also entailed risk of duplicate and excess payments.

3.8.2 Improper and inadequate sequencing

The data relating to claims of payments was to be entered in a series of Proformae in sequence. A verification of the date of entering the data into the system in audit revealed that in 251* cases the dates of Proformae did not follow the prescribed sequence, rendering the data unreliable.

The data from mandatory Proforma 'B' corresponding to Proforma 'D' was missing in 741 cases involving claims of Rs 99.51 crore. This could have been detected and avoided if a 'check' had been built into the system, while entering the data for Proforma 'D'.

3.8.3 The date of sanction of a claim could not be earlier than the diary date. In 9061 cases, the date of sanction of the claim was earlier than the diary date. It is evident that the data entry was done after making payment manually. The system was not utilised for automatic processing of the various stages of the concession scheme.

3.8.4 System allowed to change details of payment

All the Proformae accepted changes in data at any stage, which carried the risk of manipulation without possibility of detection. This was especially true in the case of data in Proforma 'C' and differential Proforma 'C', which formed the basis for determining the final payment.

3.8.5 Missing records

While entering the claims for payments, the system generated a unique 'diary number' for each entry. It was noticed that a large number of 'diary numbers' were missing in sequence. Payments against these missing 'diary numbers' could not be ruled out.

Further, the system should enable linking and verification of each claim across the prescribed series of Proformae. This linkage was not possible to be verified in 514 cases involving payment of Rs 42.80 crore in respect of Proforma 'D' where the corresponding Proforma 'C' were missing. In addition there were 75 cases where details of claims in the corresponding Proforma 'C' to Proforma 'D' were missing but the system indicated payment of Rs 9.09 crore in the field 'amount already paid at Differential Proforma 'C'.

Similarly, there were 1578 cases where details of payment made did not match involving a possible overpayment of Rs 11.41 crore and 450 cases involving a possible short payment of Rs 31.93 lakh.

* In 240 cases, the sequence of Proforma 'B' was earlier than Proforma 'C' and in 11 cases the sequence of Proforma 'D' was earlier than Proforma 'B'.

3.8.6 System allowed duplicate data entry

The CSIS also allowed duplicate entry of claims and generated a new diary number for the duplicate entry. This involved risk of double payment. If the claim of a company for a particular year, month, state and product has already been entered in the system, it should not be allowed to be entered again. Sample data analysis revealed such duplicate payments aggregating Rs 23.86 crore in 63 cases as indicated in the table below:

(Rs in lakh)

Proforma	Number of cases	Duplicate payment
C	58	2377.20
D	5	9.08
B	59	-
Total		2386.28

3.8.7 No check on delayed claims

In terms of the scheme guidelines, the manufacturers were to submit, within 60 days of the date of sales or thirty days from declaration of base rate of concession, whichever was later, claim in Proforma 'C' for 'on account' payment. The claims received after the above specified periods were to be processed for hundred *per cent* payments only after receipt of certification of sales from the state governments. However, there was no provision in the CSIS to check this specification. Proforma 'C' for any period, whether past dates or future dates, could be entered at any time. Further, there was no field in this sub-module for 'date of receipt of claim'. As brought out earlier in this report the diary date was the date of making data entry in the sub-module Proforma 'C' irrespective of the fact that there could be a time gap between data entry and the date of actual receipt of the claim. In the absence of date of actual receipt the delayed submission of Proforma 'C' was calculated by assuming a time gap of 30 days between the date of actual receipt of the bill and diary date. In 142 cases, 'on account' payment amounting to Rs 28.79 crore pertaining to the period August 2002 to March 2004 was made to manufacturers/importers, who had delayed the submission of the claim.

3.8.8 No provision of rate master

There was no master table for the rates of concession. The user had to feed the rate of concession in each entry. This increased chances of data entry mistakes and manipulation.

3.8.9 Entering data in several fields not mandatory

Various important fields were not made mandatory in the system. As a result, most of them were left blank. Although the payment of concession was made, details of cheque number, cheque date, sanction number were not filled in most cases. As a result, the CSIS failed to generate an accurate report of expenditure on concession. The predefined expenditure reports treated the

period of claim as the date of payment instead of the date of the cheque, thereby generating inaccurate MIS* reports.

Recommendation

- ⇄ **The Department may review the system to provide for mandatory fields, auto-control of blank or incorrect/duplicate data entry, single unique diary number to all cases, master data and automatic transfer of data to the later Proformae with a view to ensuring accurate and authentic processing of the various stages of the concession scheme.**

3.8.10 Absence of validations

Various fields were found to be lacking proper validations, as discussed below:

- ↘ All the Proformae accepted blanks in fields relating to – quantity, base rate, final rate, total amount, eligible amount, net amount, etc. Since the fields for amounts were automatically calculated on the basis of quantity and rate, leaving either of these blank should make all the amount fields as zero and render the concerned record invalid. It was noted that in 345 cases in Proforma 'C', both the quantity and amount fields were shown as zero and in 445 cases the field 'total amount' was shown as zero. Thus, the database did not reflect the actual payment made against these claims and generated inaccurate expenditure reports.
- ↘ All proformae accepted data entry for any year/month past or future i.e. the period was not limited to a specified range. This not only increased the chances of data entry errors but also made the system prone to manipulations. For example, the field 'bill upto date' represented the month and year to which the claim pertained. This date under no circumstances can be later than the diary date. However, it was noticed that in 89 of Proforma 'C' cases, the 'bill upto date' was later than the diary date.
- ↘ All the Proformae accepted incorrect and duplicate bill number/bill date thereby making the payment tracking difficult.

Proforma	Number of cases with incorrect bill number	Number of cases, where bill number and dates were repeated
Proforma C	383	1784
Differential Proforma 'C'	109	416
Proforma 'D'	694	1513

- ↘ In Proforma 'C', the field 'quantity returned in previous month' was not useful because it affected the calculations of only the current record

* MIS – Management Information System

and did not update the corresponding records of the previous month. This also resulted in generation of incorrect reports.

- ↘ In the master module, tables of state, product and company accepted invalid characters in all the fields, accepted blank in the code fields and also accepted duplicate details in the name's field of the state, company, address, etc.
- ↘ The field 'Bill Passed/Unpassed' was redundant since the system did not set this field automatically. The users were required to set this field manually to "P" or "U" depending upon the position of the claim. The field should be set automatically depending upon the status of the payment.

Recommendation

- ⇄ **The fields related to payment should be made mandatory. Further, the report of expenditure on concession should then be based on the date of cheque and not the month of claim.**

3.9 Difference of Rs 576.13 crore between the database and actual expenditure

There were differences between the amount of concession reported by the Department in its Annual Reports and as reflected by the database as shown in the table below.

(Rs. in crore)

Year	Actual Expenditure reported by the Department	Expenditure reflected by the Database	Difference
2001-02	4503.52	4112.44	391.08
2002-03	3224.52	3081.94	142.58
2003-04	3326.00	3283.53	42.47
	11054.04	10477.91	576.13

The difference remained unreconciled. The database is, thus, unreliable and the reports generated by the system, being incorrect, are not useful.

3.10 Recoveries worth Rs 48.96 crore not made subsequent to change in rates

In terms of the guidelines of the scheme, recoveries/credits, if any, subsequent to notification of change in base rate or announcement of quarterly final rate of concession, from the manufacturers/importers had to be deposited within 45 days from the date of notification of the revised concession rates. In case payment was not made by manufacturers/importers within 45 days, penal interest at the rate of 2.5 *per cent* over and above the ruling bank rate on working capital loans was to be recovered on the amount of recovery from the 46th day till the credit was afforded. The system failed to either *prompt* the user of occurrence of any such case or make the required calculation. During the period April 2001 to December 2003, details of 15,709 cases of Proforma

'C' were entered into the database of which, in 2851 cases, the quarterly rates announced were less than the base rate on which 'on account' payments were released. Sample test disclosed 405 cases of Proforma 'C' where a recovery of Rs 48.96 crore was shown outstanding till date for want of details in Differential Proforma 'C' or Proforma 'D'.

3.11 Unsettled 'on account' payment worth Rs 2,028.22 crore

The state governments are required to send the verification certificates in Proforma 'B' within 90 days from the date of receipt of information from the suppliers in Proforma 'A'.

However, as depicted in the table below, in 4563 cases 'on account' payment aggregating Rs 2,028.22 crore remained unsettled for want of Proforma 'B' from the state governments.

(Rs in crore)

Delay	Number of cases	Amount
90 to 150 days	1376	780.74
150 to 180 days	357	252.39
180 to 1077 days	2830	995.09
Total	4563	2028.22

The system failed to prompt the user of those cases where the certification of sale was overdue from the concerned state government.

3.12 Payment of Rs 57.41 crore of claims more than the certified quantity

Sample checks disclosed that during the period April 2001 to March 2004, in 127 cases, the quantity claimed in Proforma 'D' was greater than the quantity certified by the state government in Proforma 'B'. Thus, the database reflected an overpayment of Rs 57.41 crore. The system failed to prompt the user of discrepancies in the quantity field and recover the amount paid excess from the subsequent bills.

Recommendation

⇕ **Necessary control features should be incorporated in the software to prompt the user in case of pending recoveries.**

3.13 The draft review was issued to the Department on 07 December 2004. While accepting most of the observations, the Department in its interim reply received on 02 February 2005, stated that considering the urgent need for creating a computerised database for the scheme, a systematic approach could not be followed. The department also accepted that need based amendments were made in the CSIS. The department, however, felt that the system and the reports generated therefrom had been a great assistance, specially in monitoring backlog of sales certification for follow up with the states for

clearance in terms of finalising policy approach and thus the database was not totally unreliable. They informed that they had already incorporated a number of audit recommendations and other recommendations would be adopted keeping in view the scheme's overall implementation requirement.

It is recommended that the Department may complete strengthening of the system to address the shortcomings pointed out in this report.