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## **Semi-Conductor Laboratory**

### **Vision Statement**

- Create a Strong R&D base in the country in the field of microelectronics.
- Design & Development of devices in cutting edge technology.
- Manufacture VLSI/MEMS based systems & sub-systems.
- Transform SCL as a Centre of Excellence in microelectronics in the country.

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## Composition of Semi-Conductor Laboratory (SCL) Society

Secretary to the Government of India, Department of Space, Bangalore	President
Secretary to the Government of India, Department of Atomic Energy, Mumbai	Member
Secretary to the Government of India, Department of Information Technology, New Delhi	Member
Secretary to the Government of India, Department of Defence Research and Development, New Delhi	Member
Additional Secretary & Internal Financial Adviser, Department of Space, Bangalore	Member
Director, Semi-Conductor Laboratory, Chandigarh	Member
Dr. B.N. Suresh, Director ISRO Institute of Space Technology, Thiruvananthapuram	Member
Dr. Chandrashekhar, Director Central Electronics Engineering Research Institute (CEERI), Pilani	Member
Prof. S.L. Lahiri Deptt. of Electronics & Telecommunications Engineering, Indian Institute of Technology, Kharagpur	Member

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## Composition of the Management Council Semi-Conductor Laboratory

Secretary to the Government of India, Department of Space, Bangalore	Chairman
Director, Semi-Conductor Laboratory, Chandigarh	Member
Secretary to the Government of India, Department of Atomic Energy, Mumbai	Member
Secretary to the Government of India, Department of Defence Research and Development, New Delhi	Member
Additional Secretary or Joint Secretary to the Govt. of India, Department of Space, Bangalore	Member
Shri S. Satish, Deputy Director, DOQR/ISRO HQs., Bangalore	Member
Chief Executive Officer, SITAR Defence Research and Development Organisation, Bangalore	Member
Dr. M.M. Nayak, Dy. Director, Semi-Conductor Laboratory Chandigarh	Member
Shri John P. Zachariaiah, Associate Director, VSSC, Thiruvananthapuram	Member

## Introduction

Administrative control of erstwhile Semiconductor Complex Limited (SCL) was transferred to Department of Space from Department of Information Technology by Government of India on March 01, 2005. Semi-Conductor Laboratory as a Society was registered on November 08, 2005, under the Societies Registration Act, 1860, as amended by the Punjab Amendment Act, 1957. Main emphasis of the society is on Research & Development in the field of Microelectronics.

SCL, identified as the National Foundry for MEMS under the National Programme on Smart Materials (NPSM), continued its association and participation in National Programme on Micro and Smart Systems (NPMAS).

## Technical Activities

The technical activities pursued by SCL in accordance with its vision statement pertain to the following areas:

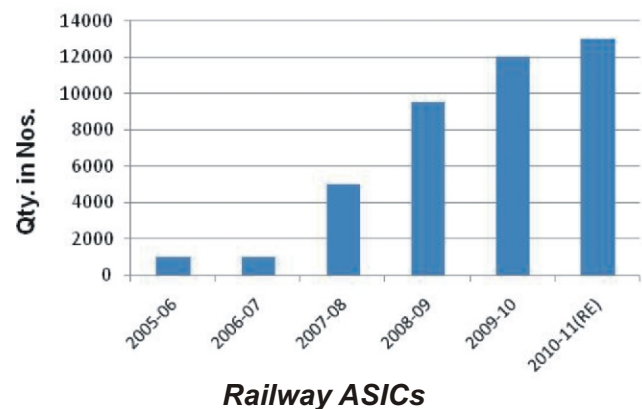
- VLSI & MEMS Fabrication, Assembly and Testing
- VLSI Design & Process Technology Development
- Systems Engineering & Assembly
- Technical Support Services
- Reliability and Quality Assurance

Highlights of the activities for the period April 01, 2009 to March 31, 2010 are presented in this report.

## VLSI, MEMS Fabrication and Assembly

Fabrication of Wafers for various projects and ASICs

continued during the year. The wafers were processed for CMOS products such as Dosimeter, RTX Glue Logic, Video Processor Logic (VPL), Sequence Controller and Frame Transfer Imager (FTI). Also, developments completed in key projects such as MEMS based Pressure, Temperature and humidity sensors, RF Components. RF Filter has been delivered as per the desired process. Major VLSI projects executed during the year include a set of 8 devices for Control Electronics of 3-Phase Electric Locomotive for Indian Railways.

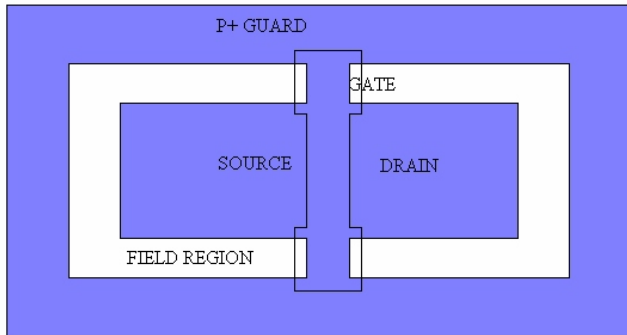


Multi-chip packaging process is developed for Accelerometer and an ASIC in a single package and the prototypes were delivered to IIT-Kharagpur for characterization.

## R&D Process Technology Development

A significant achievement in the year is development of radiation hard devices using layout design as well as process technology design. Four types of logic devices namely Quad 2 input NAND gate, Four bit binary counter, Octal bus buffer and Octal D Latch are developed and are found to withstand TID greater than 100kRad(Si). Also, the radiation

hardening by the designed process technology is validated with prototype sequence controller which also was found to withstand greater than 100kRad(Si).

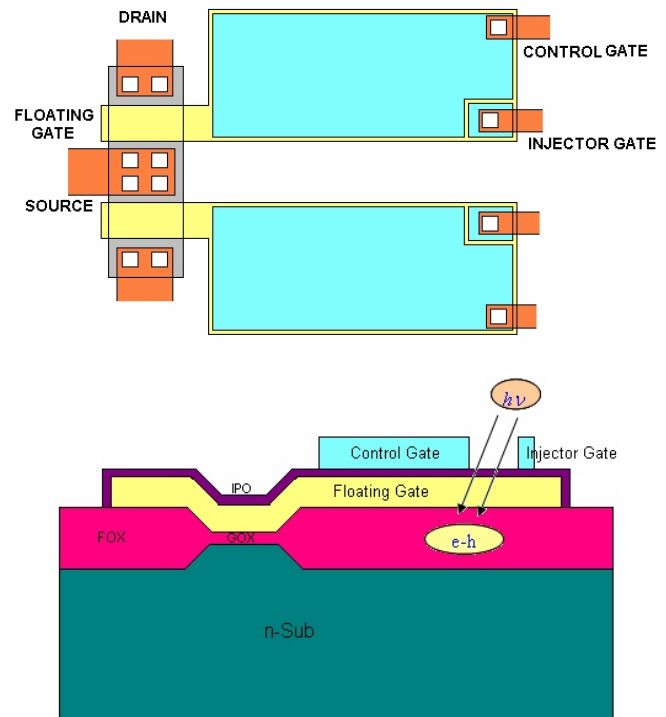


**Structure for Radhard by layout design**

The design incorporates extended gate layout NMOS transistor structures with P+-guard rings fabricated in 0.8 micron standard process (gate oxide=175Å) and also Rad-hard circuit architectures like triple modular redundancy for tolerance against SEU. The devices showed less than 150mV shift in  $V_t$  upto 100kRad(Si).

The process design and device layout for Floating gate MOSFET sensor for dosimetry is completed. The polysilicon floating gate p-channel MOSFET has a large extension over thick field oxide, an Injector gate for pre-charging the floating gate by Fowler Nordheim (F-N) tunneling. The device is designed and fabricated in 1.2micron Double Poly CMOS process ( $G_{ox}=220\text{Å}$ ,  $F_{ox}=0.8\text{-}1.2\mu$  & Tunnel oxide=250-500Å) and a pair of devices are incorporated to facilitate differential readout for improved sensitivity, temperature compensation

resistance against effects of ionization. The device is characterized for performance and reusability.



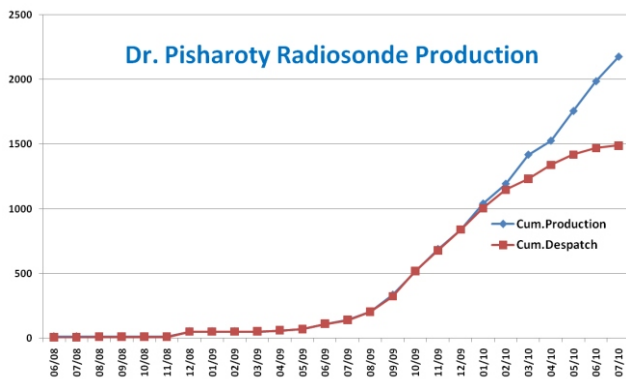
**Floating Gate MOSFET for Dosimetry**

### Design & Testing

IP design of Serial Parallel Interface (SPI) for communication protocol has been completed. Design of ROIC(320x256), SRAM(32KB), CCD Signal Processor, RadioSonde ASIC, Timing Sequence ASIC, Driver for modulator ASIC etc. are at various stages of development. Development of test hardware and software for ADS1255, MAX1542, LD3985, IMSAC, BAC and pressure sensor has been completed. The maintenance activities of all the testers including ULTRA FLEX has been taken up in-house and an average up time greater than 90% is achieved.

## System Engineering and Assembly

Design, development, fabrication and testing of boards and subsystems for Airforce and atmospheric studies are continuing. About 1200 indigenously developed Dr. Pisharoty Sonde systems are supplied to various National Institutions including ISRO, IMD, NARL, etc.



The production capacity of these systems is being enhanced to 400 nos/month. The fabrication & calibration facilities are being augmented accordingly. Fabrication and testing of 285 units of professional circuit boards for fuel flow converter, automatic oil temperature controller unit and switching circuits, in aircrafts were supplied to Air Force. 12 Fire warning systems (Firemod kits) and two test rigs were supplied on receipt of final clearance from user. The repair of Electronic Energy Meters (EEM) under warranty continued during the year.

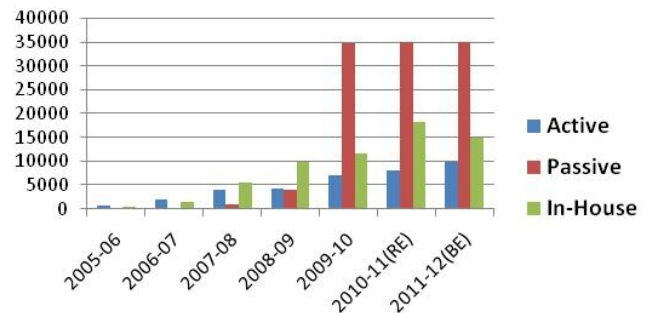
## Reliability & Quality Assurance Activities

R&QA is engaged in ensuring the performance, quality and reliability of all devices, subsystems and

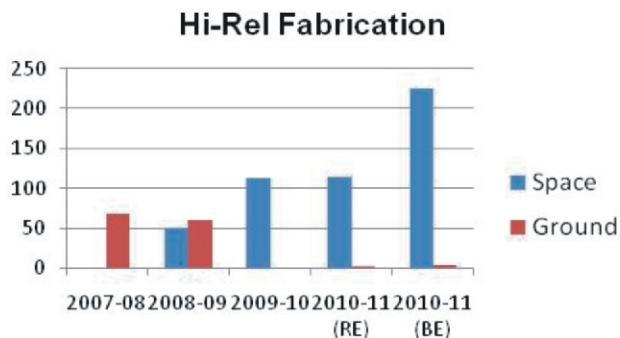
systems developed in SCL by conducting in-process Quality Audits, failure analysis, test and evaluation. Pertinently, there were no reported field failures in the Railway devices and Radiosonde systems. Implementation of ESD control program and detailed documentation are also being pursued. The environment test capabilities are enhanced with the installation of Thermal shock chamber which facilitates testing in -80°C to +220°C.

The screening and qualification of active and passive components for high reliability space application is carried out for ADS1218Y, leaded components (RNRs & RWRs), chip components for VSSC, LEOS, ISAC, SAC and LPSC.

## Component Screening



Further, high-reliability fabrication activities such as soldering, connectorization, local potting and harnessing is being carried out at SAC, for ground as well as space applications. Assembly of 211 Nos Ultrasonic Level Sensors (USLS) was completed. Hi-Rel fabrication of 158 cards and 366 connectors was also carried out.



### Office Automation

SCL continued to lay emphasis on e-governance by maintaining in-house office automation and allied computer applications namely Stores Inventory Management System & Library Management System, Leave Management System. Process of implementation of application for administrative functions including purchase function has also been started. SCL Web Site has been revamped with emphasis on technical contents and the domain name changed to government portal. Activities relating to administration and maintenance of Intranet, Internet/email services and in-house maintenance of computer hardware continued. SCL continues to be a active member for implementation of Digital Work Flow across all centers/units of DOS/ISRO.

With ongoing upgradation of VLSI Fabrication Facility at SCL, integrated Semiconductor Production MIS is required for lot planning, scheduling, tracking, tool status, report generation and database management etc. To fulfill this objective, in house development of Device

Manufacturing Integration System (DMIS) has been taken up. The scope of work includes Access Control, Lot Scheduling & Tracking, Inventory Management, Equipment Management, Spares Management, Indent Management, Data acquisition, directly from Tools.

### Technical Support Services

Technical Support Services were provided on 24X7 basis to cater to the need of various facilities requiring continuous supply. These services include Ultra High Pure Water, Bulk Gases, Heating, ventilation and air conditioning, reliable electrical supplies, Clean Compressed Dry Air, Process Vacuum System and Exhaust & Gas Abatement System. The maintenance activities are undertaken utilizing the internal resources achieving near zero down time of the utilities.

As part of the pre-upgradation activities, two new energy efficient Chilling Machines for Central Air Conditioning Plant have been installed and two more are under procurement.

Upgradation of Facilities to support 8" Fab. has been taken up by dividing the work in 17 tender packages. 12 contracts are awarded and the remaining 5 are under different stages of tendering process. The utilities augmentation is expected to be completed by June, 2011. Consequent upon de-hooking of 6" Tools, utilities supply to VLSI Fab is discontinued. Utility Plants and Systems operated satisfactorily for Testing, Assembly, R&QA & MEMS operations.

## VLSI Facility Upgradation

The contract for up-gradation of wafer Fab to 0.18µm CMOS 8" line was signed with Tower Semiconductor Ltd., Israel (TSL) on 21st November, 2009 after all due approvals and the project implementation started as on November 30, 2009. The estimated completion time is 24 months.



***Signing of Contract with TSL***

The commensurate augmentation of utilities like clean rooms, bulk and specialty gases, Gas distribution systems, ultra high purity water, heating, ventilation and air conditioning system are in progress on non-turnkey basis.

## Security & Safety

The entry in the campus is regulated through Access Control System using personalized smart card. Visitor's movement is controlled by issuing photo identity card and through door frame metal detectors. The security of installation is looked after by CISF with no untoward incident during the year. As an additional security measure, power fencing has been installed on the compound wall of SCL

campus. CCTV is also installed at strategic points in the campus. The security measures are periodically reviewed by Security Coordination & Review Committee (SCRC) comprising officials from Punjab Police, IB, State Administration and Health Services Punjab.

Fire Protection/ Detection installation were periodically tested and systems maintained in a state of readiness. Augmenting the fire fighting infrastructure, a new Fire Tender has been procured which is likely to be put to service by Oct. 2010. Fire detection System was installed in the buildings which were not covered earlier. Mock Fire Drills were conducted by the Fire Wing personnel who also participated in monthly drills conducted by CISF. Fire Safety week was observed from 14<sup>th</sup>-21<sup>st</sup> April, 2009.



***Director inspecting Safety Systems***

## Construction & Maintenance

The construction & maintenance activities forming the part of Technical Support Services were carried out as planned and as per the requirements arising

from time to time. Construction of Sub-Station, Gas Bunker is in progress. A new Bore Well has been developed to cater to the requirements of the facility.



***Silicon Enclave under construction***

For SCL Housing Colony Project the contract for construction of 60 nos. Quarters, Director's Residence and Guest House was awarded in April 2009 and is progressing well. The contract for External Services (Public Health, Road and Electrical Works) is also awarded. The construction of phase-1 activities are in advanced stage of completion. Parallely, the development of horticulture in the colony is also taken-up.



***Plantation of Saplings on Independence Day***

**Energy Conservation**

Energy conservation is one of the commitments of SCL and all possible measures are being taken for achieving this goal. Awareness is created among all the employees about energy saving measures which helped in effective implementation. Some of the measures taken during the year include:

1. Two new energy efficient CFC free chilling machines are installed and operationalized. Two more are under procurement.
2. AHUs in office areas are being turned-off at periodic intervals, luminaries are switched off when not required.
3. Power factor is maintained above threshold limit prescribed by PSEB for optimizing capacity utilization of transformer, cables etc. and consequently SCL continues to avail discount in power bills due to this.
4. Review and energy audits of all the installations are conducted at regular intervals and the measures thereof are implemented.
5. The old light fixtures are being replaced with energy efficient light luminaries in a phased manner.
6. Solar water heater replaced the conventional heater in SCL canteen.
7. A few solar lighting systems are installed in the campus.

## Environment Management

Environment preservation remained under the focus of the Laboratory. Maintenance of lawns and development of green belts, tree plantation etc. was done on regular basis. Treatment of effluents and gaseous emissions from the process area was carried out effectively with the help of various system installed in the campus viz. Effluent Treatment Plant, Wet Scrubber, Exhaust System etc. in line with requirements / guidelines as laid down by Punjab Pollution Control Board (PPCB).

Regular testing of effluent is done to ensure conformance to the standards set by PPCB. Treated effluent is being used for irrigation of lawns / green areas. Water reclaim system is planned as part of the augmentation of utilities and other systems for the 8" Fab. line.

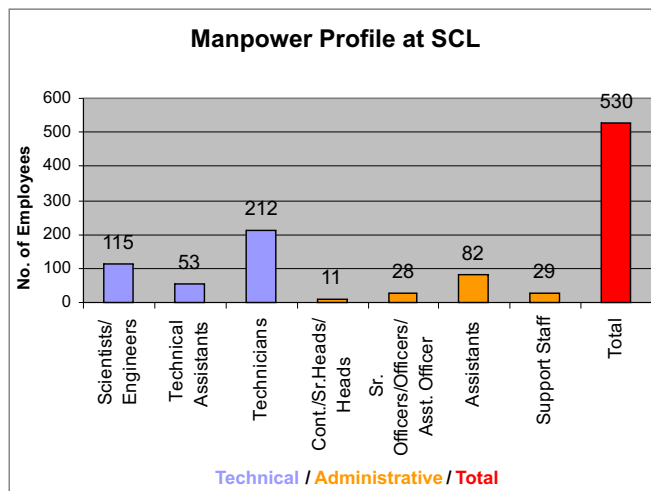


**Green Belt in SCL**

## Human Resources & Welfare measures

Total manpower strength of SCL as on 31st March, 2010 was 530 with 38 female employees including one Sci/Engr. 'SD' and eight Sci/Engr. 'SC' recruited

during 2009-10. Also, one Sci/Engr. 'SE' joined SCL from DOS. With this, the manpower profile of SCL is as below.



Professional Update Allowance and other Social Security measures viz. VISWAS and SAFE schemes continued in SCL.

The reservation for Schedule Castes, Schedule Tribes and other Backward Classes in the services continued to be observed in SCL. The position of SC/ST and OBC employees as on 31st March, 2010 is as under.

S.No.	Category	Sci./Tech.	Admin.	Total
1	SC	83	23	106
2	ST	2	0	2
3	Handicap	2		2
4	OBC's	19	6	25
5	Ex-Ser. Men	1		1

## Progressive use of Hindi

All the annual Programmes framed by the Department of Official Language are being followed at SCL. A number of enabling measures for effective implementation of the Official Language have been taken. Books of eminent Hindi writers, popular Hindi Magazines, Glossaries and Dictionaries have been procured. Five Society employees were nominated for Hindi Prabodh, Praveen and Pragya examination conducted by Central Hindi Training Institute. Also, employees are encouraged to participate in various competitions organized by the local Town Official Language Implementation Committee. Hindi Diwas and Vishwa Hindi Diwas were organized in the society. All general circulars are being issued bilingually and also announcements on the paging system are bilingual. The annual inspection for implemented of Hindi in the society has been completed.



**Hindi Diwas Celebrations**

## Vigilance Activity

It has been the endeavor of vigilance division to strengthen the Preventive Vigilance mechanism. Activities like routine inspection, timely filing of monthly and quarterly progress reports for work and contracts, vigilance and disciplinary cases, and issuance of NOC etc. were continued during this period. Efforts were also made to increase transparency in functioning by establishing the proper procedures, checklist, and training the employees about government rules and regulations. Vigilance week-2009 was observed as per directive of Central Vigilance Commission (CVC) from November 03-07, 2009. All the directives from DOS/CVC were widely circulated for compliance.



**Controller SCL Administering Oath to Employees during Vigilance Week**

## In-house Journal

The publication of biannual and bilingual (English and Hindi) in-house Newsletters entitled "Footprints on Silicon" and "SCL Darpan" to bring into focus the R&D activities and achievements, continued during the year.

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## Lecture Series

Following lectures were delivered by the visiting dignitaries for the benefit of SCL employees.

- o Green buildings and LEED (Leadership in energy and environment design), by Shri Venketachalan, Head-HVAC, ISAC.
- o Alice MUON, Spectrometer at LHC Indian Contribution, by Prof. Sukalyak Chattopadhyaya, Project Leader-CERN, SAHA Institute of Nuclear Physics, Kolkata.



***Shri MKG Nair Former Director LPSC  
delivering a talk.***

Following technical papers were published in various international and national journals/conferences.

Kamaljeet Singh, K.Nagachenchaiiah, & D.Bhatnagar, "Electromagnetic Modeling of Conductor backed-CPW based RF MEMS capacitive shunt switch," International Journal of Electronics, Vol96, No8, Aug.2009, pp 887-893  
Kamaljeet Singh, K. Nagachenchaiiah, D.

Bhatnagar, & S. Pal," Notch Implemented Dual Behavior Resonator (DBR) Filter and Diplexer at Ku-Band," Microwave Journal, Vol 53, No.4, page 206, April,2010.

Kamaljeet Singh, K. Nagachenchaiiah, D. Bhatnagar," Novel ultra-wideband stopband filter on silicon & alumina," International Journal of microwave & optical Technology, Vol 5, No.4, July 2010.

## AUDITORS' REPORT

To  
The Members of  
Semi-Conductor Laboratory

1. We have audited the attached Balance Sheet of **Semi-Conductor Laboratory** as at 31.03.2010 and the Income & Expenditure Account for the period ended on that date. Preparation of these financial statements is the responsibility of the Society and our responsibility is to express an opinion on these financial statements based on our audit.
2. We have conducted our audit in accordance with auditing standards generally accepted in India. Those Standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by the Society as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.
3. In the light of this, we report that:
  - (i) We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purposes of our audit;
  - (ii) In our opinion, proper books of account have been kept by the Society so far as appears from our examination of those books;
  - (iii) The Balance Sheet and Income & Expenditure Account dealt with by this report are in agreement with books of account;
  - (iv) In our opinion and to the best of our information and according to the explanations given to us, the said accounts give the information, which give a true and fair view in conformity with the accounting principles generally accepted in India;
    - (a) in the case of the balance sheet, of the state of affairs of the Society as at 31.03.2010.
    - (b) in the case of the Income & Expenditure account, of the Income/ Expenditure for the period ended on that date.

For A.K. Sood & Associates  
Chartered Accountants

Place: Chandigarh  
Date: 16.09.2010

**A.K. Sood**  
Partner

## SEMI-CONDUCTOR LABORATORY BALANCE SHEET AS AT 31st. MARCH, 2010

₹ in '000

Particulars	Sch No.	As at 31/3/2010		As at 31/3/2009	
<b><u>Sources of Funds</u></b>					
Capital Fund	1		538346		504698
Reserves & Surplus	2		<u>7562192</u>		<u>6508775</u>
			<u>8100538</u>		<u>7013473</u>
<b><u>Application of Funds</u></b>					
Fixed Assets	3				
Gross Block		639919		602699	
Less; Depreciation		<u>344953</u>		<u>273993</u>	
Net Block			294966		328706
Capital work in progress	4	<u>3305230</u>	3600196	<u>45166</u>	373872
Current Assets, loans & Advances:					
Inventories	5		106127		75616
Sundry Debtors	6		51583		97187
Cash & Bank balances	7		5940263		6098171
Other Current Assets	8		348960		455488
Loans & Advances	9		<u>118550</u>		<u>116836</u>
			6565483		6843298
Less; Current liabilities & Provisions	10	<u>2065141</u>	4500342	<u>203697</u>	6639601
			<u>8100538</u>		<u>7013473</u>
Notes to Accounts & accounting policies. Schedules 1 to 16, form an integral part of accounts.	16				

As per our report of even date attached.  
for A.K.SOOD & ASSOCIATES  
Chartered Accountants

**(A.K.SOOD)**  
Partner

**(K.NAGACHENCHIAH)**  
Director

**( MEETA RAJIVLOCHAN)**  
Controller

Chandigarh  
Dated: 16.09.2010

**(J.M. Amba)**  
Head(Accounts)

**SEMI-CONDUCTOR LABORATORY**  
**INCOME & EXPENDITURE ACCOUNT FOR THE PERIOD FROM 1.4.2009 TO 31.3.2010**

₹ in '000

Particulars	Period Ended 31/3/2010	Period Ended 31/3/2009
<b>I N C O M E</b>		
Sales (including agency sales)	56374	59029
Less : Excise Duty	<u>3515</u>	<u>6154</u>
Income from Services/Assembly Job	8337	69765
Revenue Grant	392922	317678
Other Revenue	11	64046
Reversal of Retirement Benefit	0	42396
Revenue Receipt for pension	221	6145
Dep. of Grant Assets & Exp. of Sp. Projects	51350	8611
Accretion to WIP/Finished Goods	12	-17031
	<u>588557</u>	<u>544485</u>
<b>E X P E N D I T U R E</b>		
Raw Material Consumed	28687	20502
Stores & Spares Consumed	10152	10179
Testing & Assembly charges	45	43
Employees Remuneration & Benefits	13	320174
Power & Fuel	68874	66700
Repair & Maintenance	14	14409
Admn., Selling & Other overheads	15	8301
Security & Fire Fighting Exp.	32226	20526
Expenditure on IT & Services	0	28314
Inventory & Petty Assets written off	1949	1068
Depreciation	70960	86494
	<u>555777</u>	<u>496403</u>
Excess of Income over Expenditure transferred to Balance Sheet	<u>32780</u>	<u>48082</u>

As per our report of even date attached.  
for A.K.SOOD & ASSOCIATES  
Chartered Accountants

**(A.K.SOOD)**  
Partner

**(K.NAGACHENCHIAIAH)**  
Director

**( MEETA RAJIVLOCHAN)**  
Controller

Chandigarh  
Dated: 16.09.2010

**(J.M. Amba)**  
Head(Accounts)

## Schedule 1

### Capital fund

₹ in '000

Particulars	As At		As At	
	31/3/2010		31/3/2009	
Corpus Fund	504698		267021	
Add : Retirement benefit Written Back	868		189595	
Add : Excess of Income over Expenditure	32780	538346	48082	504698
		<u>538346</u>		<u>504698</u>

## Schedule 2

### Reserve & Other Funds

₹ in '000

Particulars	As at	Additions/	Deduction	As at
	1/4/2009	Adjustments		31/3/2010
Spl, Reserve-Augmentation/Upgradation*	5767654	997039	35752	6728941
Capital Reserve	207188	0	0	207188
Special Reserve	311307	0	0	311307
Sponsored Projects**	12617	33950	5183	41384
Grant for Capital Assets	210009	73778	10415	273372
	<u>6508775</u>	<u>1104767</u>	<u>51350</u>	<u>7562192</u>

\*Additions include interest of ₹ 600000 earned on unutilised grant during the year.

\*\* Includes NPMAS, Radio Sonde Projects and MEMS Projects

### Schedule 3

### FIXED ASSETS

₹ in '000

	GROSS BLOCK (AT COST)				DEPRECIATION				NET BLOCK			
	AS AT	ADDN./TRAF.	SALES/ADJ.	AS AT	AS AT	DURING	ON	AS AT	AS AT	AS AT	AS AT	
	01/04/2009	DRNG. PERIOD	(NET)	31/3/2010	01/04/2009	THE PERIOD	SALES/ADJ.	31/3/2010	01/04/2009	31/3/2010		
LAND FREEHOLD	48010	0	0	48010	0	0	0	0	48010	48010	48010	
BUILDINGS	81973	0	0	81973	21890	6008	0	27898	60083	54075		
PLANT & MACHINERY	431495	0	-70010	361485	242060	37712	-21176	258596	189435	102889		
FURNITURE & FITTINGS	6144	0	0	6144	1665	448	0	2113	4479	4031		
VEHICLES	482	0	0	482	186	44	0	230	296	252		
GRANT ASSETS	34530	21876	-3482	52924	8182	9280	-1516	15946	26348	36978		
PRE-UPGRADATION ASSETS	0	4450	73492	77942	0	15712	22692	38404	0	39538		
SPONSORED PROJECTS	65	10894	0	10959	10	1756	0	1766	55	9193		
	602699	37220	0	639919	273993	70960	0	344953	328706	294966		
	497658	105258	217	602699	187499	86494	0	273993	310159	328706		

- NOTE :
1. Building include flat at Asiad village, New Delhi and office space at SCOPE MINAR, Delhi purchased on leasehold basis.
  2. Freehold land includes factory land allotted by Punjab Govt. at a nominal price of ₹ 10/- only.

## Schedule 4

### Capital work-in-progress

₹ in '000

Particulars	₹ in '000	
	As at 31/3/2010	As at 31/3/2009
Work in progress:		
Capital WIP - Civil	40866	899
Material in Transit - Facility	0	1407
Plant & Machinery	1252448	36951
WIP - Fab Upgradation	2005626	5909
Advances to Contractor	6290	0
	<u>3305230</u>	<u>45166</u>

\* Capital WIP includes housing project.

## Schedule 5

### Inventories (As certified by the Management)

₹ in '000

Particulars	As at 31/3/2010		As at 31/3/2009	
At or Below Cost:				
Tools & Masks	2		2	
Stores & Spares	5479		2182	
Add: In Transit/ Inspection	<u>558</u>	<u>6037</u>	<u>161</u>	<u>2343</u>
At Cost:				
Raw Materials		51577		39276
Add: In Transit/ Inspection		<u>632</u>		<u>4434</u>
At lower of cost or net realisable value				
Finished Goods		16026		10632
Work in progress		<u>31853</u>		<u>18929</u>
		<u>106127</u>		<u>75616</u>

## Schedule 6

### Sundry Debtors

₹ in '000

Particulars	As at 31/3/2010	As at 31/3/2009
Debts outstanding for a period exceeding six months :		
Considered good	44036	32505
Doubtful	97910	97910
Other Debts	6349	63484
	148295	193899
Less: Provision for doubtful debts	96712	96712
	51583	97187

## Schedule 7

### Cash and Bank Balances

₹ in '000

Particulars	As at 31/3/2010	As at 31/3/2009
Cash in hand	118	72
Balance with schedule banks in Current a/c	59130	128608
Fixed Deposits	5881005	5469481
Remit in Transit	10	500010
	5940263	6098171

## Schedule 8

### Other Current Assets

₹ in '000

Particulars	As at 31/3/2010	As at 31/3/2009
Accrued Interest on FDRs/Others	348960	455488
	348960	455488

## Schedule 9

### Loans and Advances

₹ in '000

Particulars	As at 31/3/2010		As at 31/3/2009	
Loans:				
Employees		6517		6022
Advances:				
Recoverable in cash or in kind or for value to be received				
Employees		3160		850
Suppliers		4737		4208
Claims	10216		11931	
Less Provision	<u>454</u>	9762	<u>454</u>	11477
Income Tax		11055		10916
Others	1868		1867	
Less Provision	<u>1208</u>	<u>660</u>	<u>1208</u>	<u>659</u>
		29374		28110
Deposits:				
Custom and other				
Government authorities		73844		74217
Others		<u>8815</u>		<u>8487</u>
		82659		82704
		<u>118550</u>		<u>116836</u>

## Schedule 10

### Current liabilities and Provisions

₹ in '000

Particulars	As at 31/3/2010	As at 31/3/2009
Current Liabilities:		
Sundry Creditors:		
(i) Total outstanding dues of small scale industrial undertakings	0	0
(ii) Total outstanding dues of creditors other than small scale industrial undertakings	1944313	75951
Earnest Money/Security Deposit	12137	6041
Advance from customers	82606	94557
Other Liabilities	24139	26553
PROVISIONS:		
Provision for Excise	1946	595
	<u>2065141</u>	<u>203697</u>

## Schedule 11

### Other Revenue

₹ in '000

Particulars	As at 31/3/2010	As at 31/3/2009
Interest (Gross)		
Fixed Deposits	62423	
Employees	38	
Others	<u>0</u>	
	62461	53504
Sale of scrap	190	805
Profit on Sale of Fixed Assets	0	344
Miscellaneous Receipts	1731	52
Rental received	168	168
Prior Period Expenses Written Back	0	9173
	<u>64550</u>	<u>64046</u>

## Schedule 12

### Accretion/Decretion to Work in progress and Finished Stocks

₹ in '000

Particulars	As at		As at	
	31/3/2010		31/3/2009	
Own manufactured Products				
Finished Goods				
Closing Stock	15524		10130	
Opening Stock	10130		11061	
W/off during the year	<u>0</u>	5394	<u>0</u>	-931
Work in Progress				
Closing Stock	31853		18929	
Opening Stock	18929		35029	
W/off during the year	<u>0</u>	12924	<u>0</u>	-16100
Trading Products				
Closing Stock	502		502	
Opening Stock	502		502	
	<u>0</u>		<u>0</u>	0
		<u>18318</u>		<u>-17031</u>

## Schedule 13

### Employees Remuneration & Benefits

₹ in '000

Particulars	As at	As at
	31/3/2010	31/3/2009
Salaries & wages	271772	182001
Contribution to funds	3026	1532
Interest due on NPS	455	0
Training charges	0	20
Retirement Benefits	12910	0
Welfare Expenses	<u>32011</u>	<u>48405</u>
	<u>320174</u>	<u>231958</u>

## Schedule 14

### Repairs & Maintenance

Particulars	₹ in '000	
	As at 31/3/2010	As at 31/3/2009
Buildings	4167	2900
Plant & machinery	8653	13110
Others	893	676
Vehicles	696	770
Repair MEMS Facility	0	3323
	<u>14409</u>	<u>20779</u>

## Schedule 15

### Administrative, Selling & Other Overheads

Particulars	₹ in '000	
	As at 31/3/2010	As at 31/3/2009
Bank charges	236	284
Insurance	649	1197
Legal and professional charges	384	286
Marketing overheads	292	314
Postage and Telegram	221	205
Telephone and Internet Charges	1031	1347
Printing and stationery	662	552
Newspaper, Books and periodicals	94	203
Rates and Taxes	566	683
Remuneration to Auditors		
Audit Fee	60	
Travelling & Out of pocket expenses	40	
Tax Audit	<u>45</u>	<u>145</u>
Residential Rent	248	142
Rent Others	389	384
Travelling and conveyance	1997	3518
Advertisement	300	495
Freight and incidentals	381	682
Miscellaneous Expenses	270	522
Loss on exchange rate fluctuation	- 915	29
Provision against Excise	1351	-1148
	<u>8301</u>	<u>9840</u>

## Schedule 16

### Notes to Accounts

#### 1. SIGNIFICANT ACCOUNTING POLICIES

##### i. ACCOUNTING CONVENTIONS

- a. The accompanying Financial Statements have been prepared on the historical cost basis and conform to the statutory provisions and generally accepted accounting principles.
- b. Income & Expenditure are being accounted on accrual basis. However, wherever not followed, separate disclosure is given by way of notes.

##### ii. RETIREMENT BENEFITS

Pension/Family Pension/Death cum retirement gratuity, Deposit Link Insurance and leave encashment of the employees eligible for these benefits will be paid from the budgetary support received from the DOS, Govt. of India

##### iii. CAPITAL GRANT - SPONSORED PROJECTS & OTHER FUNDS

- a. Capital Grant received for sponsored projects is shown under Reserve & Surplus.
- b. Depreciation is charged on written Down value Method as per the Income Tax Act rates prescribed for the period.
- c. Depreciation in respect of assets acquired out of capital grant- sponsored project is charged to Income & Expenditure account and corresponding amount is transferred from Reserve & Other Funds- sponsored projects to Income & Expenditure account.

##### iv. INVENTORY VALUATION POLICY

- a. Raw Material is valued at landed cost on weighted average basis.
- b. Finished goods and WIP are valued at lower of cost or net realizable value (NRV). Cost includes material cost, power and fuel, depreciation, salary and wages, repair and maintenance and other direct overheads.
- c. Material in transit is taken at cost price.
- d. Provision is made in respect of non-standard/obsolete items.

##### v. CENVAT

CENVAT credit on eligible revenue/capital purchases is recognized on receipt of such material.

##### vi. CAPITALISATION

- a. Fixed Assets are stated at cost.
- b. Where final cost of fixed assets is not ascertainable, Capitalization is made on estimated basis.
- c. No indirect overheads have been charged on fixed assets procured.

- d. Depreciation has been charged on Written down value Method as per Income Tax Act rates prescribed for the period.

**vii. GRANTS**

- a. Up gradation grants received along with interest on unutilized grants are treated as Special Reserve -Augmentation/Up gradation.
- b. Depreciation in respect of assets acquired out of grants is charged to Income & Expenditure Account and corresponding amount is transferred from Grant for Capital assets to Income & Expenditure Account.
- c. Revenue grants received & utilised are treated as Income and expenses incurred against the same are shown under the related account heads and unutilized grant is carried forward to next year.

**viii. FOREIGN CURRENCY TRANSACTIONS**

The transactions in foreign currency are accounted for at the exchange rate prevailing on the date of transaction. All monetary items denominated in foreign currency are restated at the year-end exchange rate and the difference arising from such restatement:

- a. in respect of fixed assets is capitalized to the respective assets.
- b. in respect of other transactions charged to Income & Expenditure Account.

**2. Contingent Liabilities not provided for:-**

	<b>Period Ended 31.03.10</b>	<b>Period Ended 31.03.09</b>
i. Guarantees issued by banks against counter guarantees by SCL	292.25	410.81
ii. Letter of credit & Import bills issued by banks	21209.27	394.32
iii. Octroi	45.33	45.33
iv. Claims not acknowledged as debt	0.50	26.45
<b>Total.</b>	<b>21547.35</b>	<b>876.91</b>

- V. Income tax liability, for which the Income Tax Department has filed appeals with the Income Tax Appellate Tribunal:

Assessment Year	₹ in Lac.
1982-83	1.86
1984-85	17.47
1991-92	44.96
1992-93	12.76
<b>Total.</b>	<b>77.05</b>

3. Estimated amount of contracts remaining to be executed on capital accounts is ₹ 818.28 Lac (₹ 63.73 Lac).
4. The Income Tax Assessment has been completed up to Assessment Year 2007-08.
5. The Sales Tax Assessment for S.A.S.Nagar Office has been completed up to the year 1991-92, for Delhi Office up to 2004-05 and for Noida Office up to 2005-06. However, an appeal for the year 1991-92 for refund of ₹ 86.84 Lac & ₹ 0.03 Lac toward CST & P.G.S.T respectively filed on 7.5.04 is pending before the Deputy Excise & Taxation Commissioner (Appeals), Patiala Division, Patiala against the denial of benefit of sale tax exemption and the claim has been depicted in the Balance sheet.
6. SCL has executed a running bond of ₹ 200 Lac (₹ 200 Lac) in the Office of Dy.Commissioner, Central Excise Division, Chandigarh to avail concession on Custom Duty on imported goods. Out of this, ₹ 25.47 Lac (₹ 24.34 Lac) has been utilized and balance is ₹ 174.53 Lac (₹ 175.66 Lac). There is no liability on this account.
7. Depreciation amounting to ₹ 461.67 Lac in respect of assets acquired out of grants has been charged to Income & Expenditure account and corresponding amount has been transferred from Grant for Capital Assets to Income & Expenditure account.
8. SCL is Custodian of assets as on 31.3.2010 of ₹ 1563.99 Lac (₹ 1563.99 Lac) of the project "Silicon MEMS Foundry Service" of National Programme on Smart Materials (NPSM) and of assets worth ₹ 10.00 Lac (₹ 10.00 Lac) of a project for "Screening of ADS1218" (Sigma Delta Converter) of Vikram Sarabhai Space Centre and thereby these assets have not been included in the fixed assets block of SCL.
9. Provision has not been made in respect of doubtful debts amounting to ₹ 11.98 Lac (₹ 11.98 Lac) pending final adjudication of Court cases, as SCL is hopeful of recovery thereof.
10. Excise duty of ₹ 19.46 Lac (₹ 5.95Lac) has been provided on the closing stock of finished goods and included in the valuation of Inventory. However, it has no effect on The Income & Expenditure account.
11. As per Gazette Notification dated 30th March 2007, employees who have opted for GPF (General Provident Fund), the contribution made by Semiconductor Complex Limited / Society along with interest to the Employees Provident Fund Accounts of such employees as also the refunds (including interest), if any, made by such employees has been resumed by the Society. The contribution made by Semiconductor Complex Limited to the EPF Account (along with interest) of ₹ 8.68 Lac (₹ 1188.85 Lac) has been transferred to the corpus fund and the contribution of ₹ 2.21 Lac (₹ 61.45 Lac) made by Semi-Conductor Laboratory to the EPF Account has been credited to the Income & Expenditure Account of Semi Conductor Laboratory.

12. As per New Pension Scheme, SCL has been registered with NSDL (National Security Depository Limited), a Central Record Keeping Agency in January 2010. SCL has started depositing monthly subscription / contribution with NSDL from January 2010. SCL has deposited ₹ 49.89 Lac on account of subscription/contribution for the period prior to January 2010. However, related data prior to January 2010 is being re-calculated / reconciled and the balance amount for the earlier period will be deposited thereafter.
13. Grant Assets of ₹ 700.10 Lac procured earlier have been grouped under pre-upgradation assets block to be in line with the pre upgradation sanction.
14. Capital WIP of ₹ 200.56 crores and Plant & Machinery in transit of ₹ 125.24 crores is on account of upgradation of VLSI facility from 6” to 8” wafer fab line with 0.8 micron CMOS technology in the SCL's existing facility.
15. Erstwhile Semiconductor Complex Limited had been depositing with RPFC the contribution towards pension scheme 1971 & 1995. After restructuring of the SCL Company in Society, since pensionary benefits under CCS Pension Rules 1972 are available to the employees w.e.f 01/04/2007, the above said contribution was not deposited after 31.03.2007. The RPFC, Chandigarh, vide their letter No. C-IV/Exemped/PN/5790 dated 8th October 2008, has conveyed the approval of Ministry of Labour regarding exclusion of SCL from the purview of EPF & MP Act, 1952 U/s 16(1)(b) of the Act. The amount recoverable on account of contribution deposited towards pension scheme 1971 & 1995 is still due from RPFC and the amount to be received from RPFC on this account will be taken in books of account on its receipt.
16. SCL company had taken policy from LIC through Group Gratuity Trust for the purpose to meet the gratuity liability of its employees and was depositing the premium (towards risk & fund) on yearly basis upto the year 2006-07. Fund deposited with LIC has become ₹ 1,17,42,206.00 as on 31.03.10 (including interest) as confirmed by LIC vide their letter dated 26.4.10 and the same will be taken in books of account on receipt of refund.
17. Expenditure in Foreign Currency

	Particulars	Period Ended 31.03.10	Period Ended 31.03.09
a.	Capital Goods	19705.58	183.66
b.	Consultancy/AMC	79.83	23.47
c.	Traveling & Others	0.02	1.09
	<b>Total.</b>	<b>19785.43</b>	<b>208.22</b>

18. Raw Materials -Consumed

(Qty. in Nos.)  
(₹ in Lac)

	Unit	Period Ended 31.03.10		Period Ended 31.03.09	
		Qty.	Amount	Qty.	Amount
Lead Frames/Lead performs	Nos.	34134	78.31	27258	101.04
Wafers	Nos.	1025	25.74	970	18.38
Bonding Wire	Mtrs.	2555	0.06	200	0.00
Gold 3MM-99.99	Gms.	189.1	2.99	462.8	6.00
Chemicals	Ltrs	3138	18.23	2954	13.97
Silver Epoxy	Gms	250	0.62	590	1.47
Gases	Cyl.	42	8.33	47	10.66
Diffusion Chemical	Ltrs.	9	2.19	5	1.48
Photo resist	Ltrs.	539	13.52	561	14.00
Radio Sonde Components	Nos.	1366	107.23		4.52
Air Force Card	Nos.	295	27.17		26.71
Misc.			2.48		6.79
<b>Total</b>			<b>286.87</b>		<b>205.02</b>

19. Value of imports during the year calculated on CIF basis  
(Including import of stock & sale goods)

₹ in Lac.

	Particulars	Period Ended 31.03.10	Period Ended 31.03.09
a.	Raw material (including agency sales & stock & sale items)	366.15	246.99
b.	Stores, Spares & Consumables	52.62	49.65
	<b>Total.</b>	<b>418.77</b>	<b>296.64</b>

20. Value of Raw Material Consumed during the period

₹ in Lac.

	Raw Material			
	Period Ended 31.03.10		Period Ended 31.03.09	
	Amt.	%age	Amt.	%age
a. Imported	191.09	66.61	169.39	82.62
b Indigenous	95.78	33.39	35.63	17.38
<b>Total</b>	<b>286.87</b>	<b>100</b>	<b>205.02</b>	<b>100</b>

21. Previous year figures have been regrouped and rearranged, wherever necessary to conform to the current period classification.

As per our report of even date attached

For A K SOOD & ASSOCIATES

Chartered Accountants

**(A.K.SOOD)**

Partner

**(K.NAGACHENCHIAIH)**

Director

**( MEETA RAJIVLOCHAN)**

Controller

Chandigarh

Dated: 16.09.2010

**(J.M. Amba)**

Head(Accounts)