

MINISTRY OF DEFENCE PRODUCTION



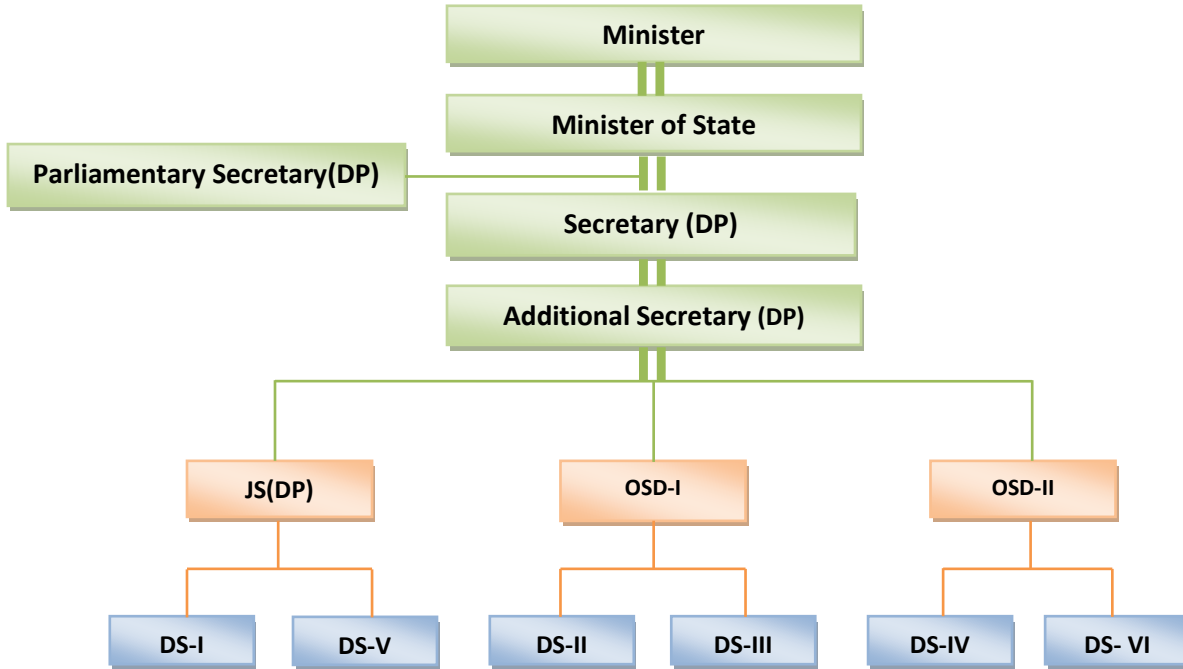
Introduction:

Ministry of Defence Production (MoDP), created in 1972 as a Division of Ministry of Defence, is now a separate Ministry. It is responsible for the policy, formulation of plans and coordination between Procurement and Development in the field of Defence Production. The Ministry is implementing a programme to achieve the following objectives:

- To provide base for maximum self-reliance in the production of defence requirements of the three services.
- To accelerate pace of technological development to contemporary levels.
- To identify, integrate and utilize industrial potential available in public and private sector for production and procurement of defence stores and equipment.
- To attain economy of scales through optimum production.

Organizational Setup:

The Organizational set-up of Ministry of Defence Production is as under:



PAKISTAN ORDNANCE FACTORIES BOARD



POF Board was constituted under the authority of POF Board Ordinance No. XVII of 1961, as amended. The functions given therein are:-

“The Principal function of the Board shall be to manage and administer the affairs of the factories and to run them on sound commercial lines so as to adequately meet during war and peace the needs of the defence of the country and to utilize the surplus capacity of the factories to meet the needs of the civilian population”.

POF Board has at present following 14 factories and also possesses 100% shares of Wah Industries Ltd., which is a Subsidiary and commercial window of POF.

- Medium Artillery Ammunition Factory, Wah Cantt.
- Heavy Artillery Ammunition Factory, Sanjwal Cantt.
- Tank/Anti Tank Ammunition Factory, Gadwal in Wah Cantt.
- Bombs & Grenade Factory, Wah Cantt.
- Small Arms Ammunition Factory, Wah Cantt.
- Weapons Factory, Wah Cantt.
- Machine Gun Factory, Wah Cantt.
- Explosives Factory, Wah Cantt.

- Propellant Factory, Havelian Cantt.
- Tungsten Alloy Factory, Wah Cantt.
- Brass Mill, Wah Cantt.
- Clothing Factory, Wah Cantt.
- Filling Factory, Wah Cantt.
- Carbide Factory, Wah Cantt.



Range of Products:

Scope of products developed and produced by POF is around 60. Below is a list of these.



➤ Weapons:

- Rifle G3 (7.62 mm x 51 Caliber)
- Light Machine Gun MG3 (7.62 mm x 51 Caliber)
- Sub Machine Gun MP5A3, A4, P7 etc (9 mm x 19 Caliber)
- Anti Aircraft Gun (12.7mm Caliber)- Chinese



➤ **Small Arms Ammunition:**

- 7.62 mm x 51 Carton Packed
- 7.62 mm x 51 Link Belted
- 7.62 mm Blank
- 9 mm x 19 Parabellum
- 5.56 mm x 45 M193 (Ball)
- 5.56mm x 45 B855 (Penetrator)
- 7.62 mm x 39



➤ **Artillery Ammunition:**

- 25 Pdr HE & Blank
- 105 mm (HOW), HE Smoke and Blank
- 122 mm HE HOW and 122 mm D30 Ammo
- 130 mm HE Gun Ammo RC & FC
- 155 mm HOW HE M107
- 203 mm HE



➤ **Mortar Bombs:**

- 60 mm HE & Smoke WP, Illu, Signal (Red & Green)
- 81 mm HE & Smoke WP, Illu
- 120 mm HE & Smoke WP



➤ **Aircraft Bombs, Aircraft & Anti Aircraft Munitions:**

- 250 Kg – Mk 82 Aircraft Bomb
- 6 Kg & 25 Lbs Practice Bombs
- 30 mm HEI
- 30 mm API
- 30 mm Practice
- 37 mm Anti Aircraft
- 20 mm Phalanx (for Navy)
- 12.7 mm x 108 API & APIT



➤ **Tank & Anti Tank Ammunition:**

- 125 mm APFSDS
- 125 mm HE
- 105 mm APFSDS
- 105 mm HE
- 100 mm APFSDS
- 100 mm HE
- 106 mm RR HEAT

➤ **Rockets**

- Arty Rocket 122 mm MBRL Yarmuk
- Rocket Propelled Grenade 40 mm HEAT (RPG-7P)
- Rocket Propelled Grenade 40 mm AP (RPG-7P)
- 73 mm Recoilless AT Grenade (SPG-9P)



➤ **Grenades, Pyrotechniques & Mines:**

- Hand Grenade Arges 84
- Grenade Target Indication, White, Red, Yellow, Green etc.
- Smoke Grenade WP P1 Mk1
- Mine AP P4
- Mine AT P3 Mk-2
- Flare Trip Wire



➤ **Military Explosives & Propellants:**

- Black Powder
- TNT, RDX, Compo B, Tetryl, Nitroguanidine, PETN
- Single, Double and Triple Base Propellants
- Ignition Charges

➤ **Commercial Explosives:**

- Emulsion Explosives, Dynamites
- Semi-Gelatinous & Powder Explosives
- Blasting Accessories, Safety Fuze Cords
- Detonating Cords
- Detonators (Plain & Electrical)

➤ **Commercial Products:**

- Brass Rods, Pipes, Plates, Sheets & Extrusions
- Gilding Metal Clad Steel Strips
- Tungsten Carbide Tool Tips, Nibs & dies
- 12 Bore Sporting Ammo

➤ **Garments:**

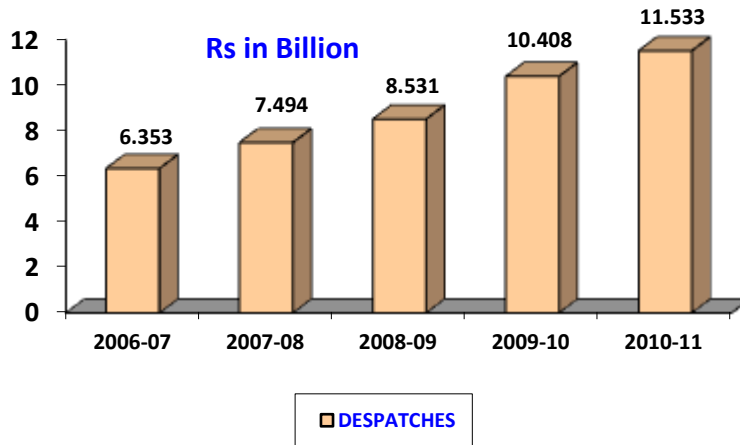
- Personal Load Carrying Equipment (PLCE)
- CCD
- Mosquito Nets
- Industrial working dress
- Gowns etc.

Production:

Production (Target VS Despatch) – FY 2010-2011.

Against production targets of Rs. 22,439.745 Million (including backlog + Recoupment) from AFs, combined dispatches to the tune of Rs 11,533.579 Million

(Estimated) were made to Armed Forces. This was the ever highest production, as depicted graphically in the bar chart below. POF is thus at present the major contributor of supply of arms and ammo required by our armed forces during the ongoing operation.



Production Capacity:

With around 80% plant over twenty years old, the gap between demand vs supply of production capacity is increasing continuously. POF is the premier Defence Manufacturing complex and meets 100% requirements of arms/ammo to the armed forces from small caliber to 155mm. However, over a period of time the available technical resources have considerably depleted due to vintage plant and machinery; almost 58% of our plant and machinery is over 30 years old. The situation faced by POF such as its highly depleted asset base, outdated technology and escalating input cost has created an impact such as systematic backlog, of 40-42 % p.a. of the Armed forces demand valuing Rs 4490 Mn. Besides, the technology gap will adversely impact fighting capability and battle field superiority. GHQ's import bill, too, has increased in the last 6 years to over US \$ 600 Mn. Resultantly, budgetary allocation and plants condition have been accumulatively reducing POF potential to meet the demand in quantity, quality and cost. POF's challenge is two fold i.e. sustainable business production which should be cost efficient and also meets the technology

edge in future operations. Therefore, comprehensive plans including restructuring, reforms, BMRE with a fresh business model have been conceived. In order to replace the old age machinery, POF worked out a US \$ 245 Mn plan. The plan duly approved by MoDP has been included in the budgetary demand of MoDP from from GoP.

BMRE Plan:

BMRE Plan is envisaged to be implemented in two phases. Phase-I is in its implementation phase for which MoDP allocated US \$ 23 Mn and POF financial US \$ 50 Mn out of SDF. Phase-II of the plan is estimated at US\$ 140.93 Mn, which remains critical for the completion of approved plan and is dependent upon allocation of adequate funds by MoDP.

IMPACT OF BMRE:

The impact of the BMRE plan is aimed at reducing the financial burden of government of Pakistan, exploiting its commercial potential for self reliance, increasing capacity and product range to meet the Army's needs and thus develop POF into a sustainable corporate entity.

JV PROJECTS:

In order to expand scope of products, efforts were continued to add new products to our existing inventory of ammo. In this direction a contract has been signed with PRC for production of 130 mm Base bleed ammo.

Exports:

In view of the changing global scenario the atmosphere for Export of defence products, is not so encouraging. However, all possible efforts were exerted to maintain the momentum of exports. By the grace of Almighty Allah, during the FY 2010-2011, the volume of exports remained at reasonable level in spite of all odds. Following were the breakdown of exports achievement:-

- i. Total Value of Contracts = US \$ 33.670 Million
- ii. Despatches Made = US \$ 17.158 Million
- iii. Orders under Production = US \$ 16.454 Million

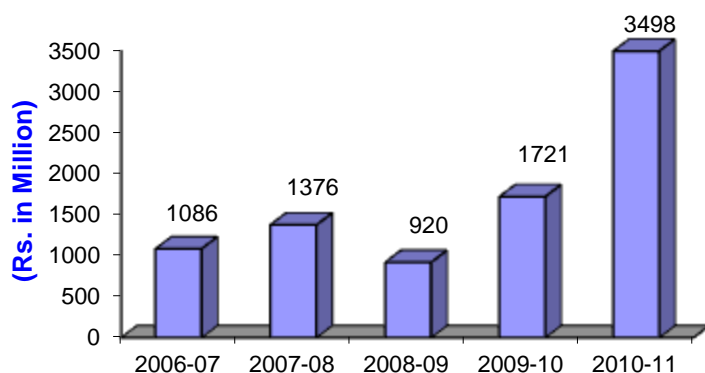
During the year 2010-2011, POF participated only in two international Defence Exhibitions i.e. IDEX-2011 Abu Dhabi and IDEF-2011 Ankara, Turkey. Attendance of POF in these exhibitions remained fruitful in terms of establishing new contacts as well as revival of existing ones which ultimately yielded into number of new pinquiries/confirmed orders.

POF's new development i.e. Personal Load Carrying Equipment (PLCE), G-3s (Short version) and POFEYE, displayed in the exhibitions, were much appreciated by the visiting delegates. POFEYE, which is designed for close combat battles fought at close ranges in urban areas remained the focal point of interest for the customers and we have been receiving inquiries from various countries. Hope, this product will play an active role to boost our exports in the coming years.

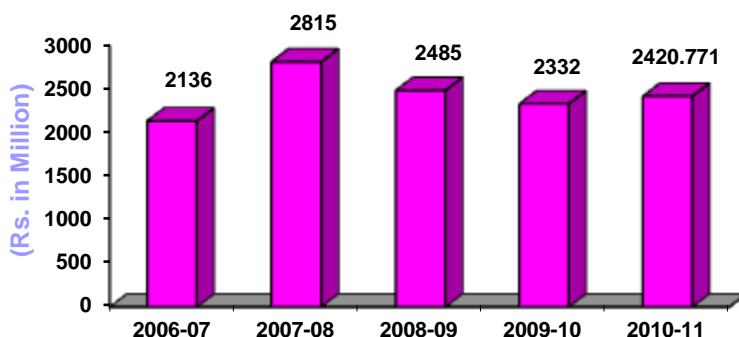
Commercial Production:

POF's Subsidiaries:

M/s Wah Industries Ltd., (WIL). In spite of recession in the country and slump in the market during the year 2010-11, all out efforts have been made for achieving optimum sales results. By the grace of Almighty Allah, WIL has succeeded to register sales of Rs. 3498.459 Million & orders in process Rs. 858.614 Million, total Rs.4357.073 Million – the highest ever in the history of WIL which has been possible due to especial/able guidance extended by the Chairman & Board Members.



M/S Wah Nobel (Pvt) Ltd is a subsidiary of POF in which M/S WIL holds majority share with 51.75% while M/s SAAB of Sweden and Al-Misehal of Saudi Arabia are other shares holders with 28.25% & 20% shares respectively. Their sales during 2010-11 were Rs.2420.771 Million. Their sales are 3.77 % higher than the 2009-10 (i.e. 2332 Million).

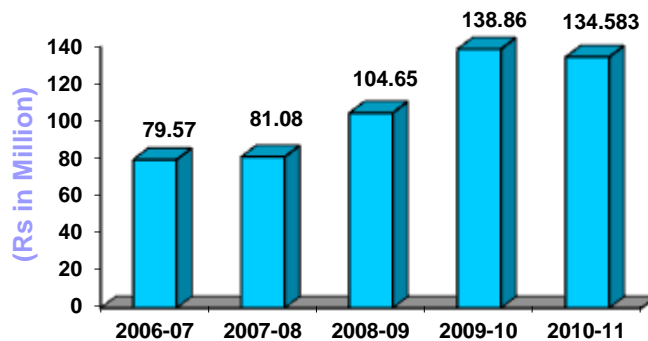


M/S HI-Tech Plastics (Pvt) Ltd. Manufactures various packaging, Containers, Carriers for Ammo, plastic parts to various units of POF, plastic tubes & plastic parts to the Civil Sector mainly bodies of A/Tk and AP Mines. During financial year 2010-11, gross sales of Hi-Tech Plastics were Rs. 134.583 Million, which is 3.10 % lesser than the sales of 2009-10 (i.e. 138.86 Million).

New Facilities Added: Two new facilities were added for self sufficiency:

- i) Extrusion Facility
- ii) Powder Coating Facility

Addition To Injection Molding Facility: One injection molding machine PLC, capacity 100 tons has been added



R & D Projects:

Although POF is not approved as an 'R&D' organization and no funds are provided by MoDP, yet POF in consultation with user & Tech Dte has undertaken following projects:-



Projects with R & D Section

- 1) RDMS - ER
- 2) PEVT Fuze
- 3) HARP (Hold fast apparatus Rocket Projected)
- 4) Modular Charge for 155mm How
- 5) Electronic Bay Opening Fuze
- 6) POF Eye
- 7) 155mm Smoke
- 8) 76mm Smoke Grenade
- 9) 76mm Smoke Grenade T-80 UD
- 10) 81mm Aerosol Smoke Grenade
- 11) Paintball Gun
- 12) 7.62x51 Armour Piercing Round
- 13) Charge M-203
- 14) Costing Control of SAA



Quality Assurance:

POF has already obtained the accreditation of ISO in following standards, which were audited by External Auditors during the year and accreditation extended:-

ISO 9001-2000	Pertains to International Quality Standards for Design, Development & Manufacture of Small Arms and Ammunitions etc.
ISO-14001	International Certificate for maintaining ideal Environmental Standards.

ISO-17025*	Pertains to the Certification of Material Testing Labs, Ballistic Labs and Standards Labs.
ISO-18001	Pertains to occupational Health & Safety Management Systems.

*The scope of accreditation includes 52 different tests, which are performed in these labs. Incidentally no defence industry in whole of the Asia possesses the accreditation of all the said three standards at a time, which is a distinction for the POF.

POF Institute of Technology (POFIT):



POFIT is imparting both Technical & Management Training to workers, Staff and Officers for Human Resource Development.

Welfare Activities:

POF undertakes lot of welfare measure for its employees and spent huge amounts like Rs. 5.910 Million on Ward Marriage, Rs.3.178 Million on Scholarship, to deserving students, including those of Deeni Madaris, Rs. 4.308 Million on Haj & Umra contingents, Rs.1.726 Million special medical treatment & grant given on the occasion of

death of POF employees or their family member Rs. 5.178 Million. The family of every employee up to BS-16, who dies in service, is also given Rs.50,000 on special Death Grant. This is addition to their normal entitlement of pension, Group Insurance, Benevolent Fund & Assistance Package.

Medical Facilities:

POF Hospital has been notified as a 500 bedded category-A Hospital of Ministry of Defence. It was established in 1962 initially as a 103 bedded Hospital. Presently it has the bed strength of 676



beds. It is a modern, tertiary care teaching hospital and Wah Medical College affiliated with POF Hospital. It provides health care facilities to serving /retired POF employees and their families. It also provides health care support to Army officers/Personnel posted at POF (their families and parents), allied groups of CMA, DSG, FAOF, FIU and IDA. It also extends its health care support to the general public within the vicinity and to industries and dwellers in the outskirts of Wah Cantt. POF has invested more than Rs.11.193 Million in last years for up-gradation of Hospital and spent Rs.207 Million on Medical Store/Medicines during 2010-11 to ensure best health facilities.



Other than structural improvement to facilitate patients following departments have been upgraded:-

➤ **Eye:**

- Phaco Emulsification Unit

➤ **Gyn / Obst:**

- CTG Machines

➤ **Orthopedic Operation Theatre:**

- Ceiling Mounted Operation Light with satellite Arm
- Ceiling Pendent for Diathermy Units

➤ **Auditorium:**

- Multimedia Projector

Workload:

Following was the workload during the year 2010-11:-

• Outdoor Consultation	-	192,286
• Indoor	-	25,937
• Laboratory	-	578,200
• X-Rays	-	3,076
• Ultrasound	-	9,175
• Operations (Major/Minor)	-	11,333
• Deliveries	-	2,640
• Dental Treatment	-	14,414
• Haemodialysis	-	1,157
• Endoscopy Procedure	-	774
• ERCP	-	90
• Echo	-	2,136
• E.T.T.	-	599

Training:

- 100 doctors are authorized/recognized by PMDC for House Job Training in all deptts in 2010-11. 60 House Officers have completed their training in POF Hosp.
- 50 doctors are authorized/recognized by CPSP for Post Graduate Training for FCPS in Internal Medicine, General Surgery and Community Medicine. 27 PGTs have sought training in POF Hosp during the year 2010-11.
- CPSP has also recognized this hospital for diploma training (MCPS, DPH).
- Students completed Pre requisite training for staff nurse in 2010. Presently 21 students in 3rd year of sacking their training in nursing school.
- Training on emergency Management, Attitude behaviour, communication and counselling skill has also been imparted to MOSs/PGTs/employees of the POF Hospital.

Sports:

POF has excellent sports facilities of international standard like 9 Hole Golf Club, Skeet Club, Indoor Games Hall, Squash Courts, Synthetic and Clay Tennis Courts, Hockey Ground having Astro turf, Cricket, Athletics and Football Grounds. Similarly Swimming Pool of



Ordnance Club was up-graded and construction of Swimming Pools at POF Havelian and Sanjwal sites has started. Our Volleyball Team is of National Standard and ranked 4th in the country.



POF Welfare Trust:

POF Welfare Trust is extending transport facilities, running Izzat Ali Shah Female Hospital, Welfare Day Care Centre & Montessori School, Welfare Computer Centre, Welfare Club-II (Marriage Hall), Drug Stores,



Polytechniq College & Nasheman School on concessional rates for the employees/residents of Wah Cantt. Besides Wah Industrial Home for the wives/widows is running and providing financial assistance to the needy persons along with catering services to the Senior Citizens of Pakistan, Wah Chapter. Moreover, POF Welfare Trust is managing the joint venture project with GASCO 2000 Rwp and Welfare Filling Station (Shell). Further, Welfare Packages Factory is manufacturing/providing the ammunition packing boxes to the various production units of POFs.



Education:

In addition to the above, under the umbrella of POF Welfare Trust autonomous projects like Wah Medical College, Wah Engineering College, University of Wah & Mashal Degree College are running and extending educational services to the

residents and suburbs of Wah Cantt at reasonable rates. Resultantly, due to these institutions, Wah Cantt has become the “Education City” in Pakistan and the literacy rate has gone up enormously. All the above institutions have shown their extra-ordinary performance / results.



HEAVY INDUSTRIES BOARD TAXILA

Over View:

Heavy Industries Taxila (HIT) is a large defence and security equipment production industry, working under Ministry of Defence Production. It comprises six production factories and engineering support facilities. The industry is under taking following activities:-

- Rebuilding, up-gradation and modernization of tracked vehicles.
- Manufacturing of tanks, Armoured Personnel Carriers and its variants, Armoured Recovery Vehicles, tank guns and security vehicles/equipment.
- Research and development of modern Armour Systems in order to incorporate latest trends in Tank Technology.

Rebuild Factories:

Heavy Rebuild Factory (T-Series): Established in 1979 with a capacity to rebuild and upgrade 50 tanks per year. Factory has under taken rebuild and upgradation of tanks T-59 M, T-59MII, T-85 and ARV W-653 including modernization of old Tanks T-55 and T-59 to Tank Al Zarrar. The factory products are as under:-

- **Upgradation of T Series Tanks into Al Zarrar:** A total of 394 Tanks Al Zarrar have been handed over to Pakistan Army. Production of next batch of 92 Tanks is in progress.
- Rebuild and upgradation of Tank T-85IIAP.
- Rebuild of Tank T-80UD engines and assemblies.
- Upgradation of ARV W653 to W653A.
- Rebuild / conversion of 105 mm T 59 Tanks to 100 mm for FC Khyber Pakhtunkhaw and Baluchistan.



Heavy Rebuild Factory (M-Series): Established in 1987, Capable of rebuilding 100 APCs M113 and 15 self propelled guns per year. Products are as under:-



➤ APC M113A1/A2.

SP M109A1 Gun

APC M113A1

➤ SP M109A1 / A2 Guns.



Advance System Rebuild Factory (ASRF): This factory was established in 2007. It has capability to rebuild following stand alone systems of Tanks including its standardization and integration:-



- (1) FCS / GCS.
- (2) Hydraulic Systems.
- (3) Electronics and Electrical sub systems.
- (4) Mechatronics Systems.
- (5) Optronics.
- (6) NVDS / Thermal Imaging Sights assembly and testing.
- (7) Auxiliary Systems (NBC, FESS, APU, Communication).

Manufacturing Factories:

Tank Manufacturing Factory:

Factory was established in 1992 with a capacity to manufacture 50 Tanks per year. Tank factory is a modern outfit with latest Tank manufacturing



facilities, which includes state of art CNC machines for heavy duty flexible machining operations and a complete infrastructure of Tank. Factory production started with manufacture of Tanks T-69, T-85 and ARV W-653. Manufacturing of 300 Tanks Al Khalid has been successfully completed.

Next batch of 21 x Al Khalid will be manufactured in year 2011 / 12. Main features of Tank Al Khalid are as under:-

- **Main Armament:** 125mm smooth bore Gun with an Autoloader and Image Stabilized Fire Control. The gun control system is also integrated with Auto Tracking and Hunter Killer Device. For night operation Tank is equipped with thermal night sight.
- **Power Pack:** Tank is equipped with 1200 HP multi fuel engine coupled with Multi Reverse Speed (MRS) having Power to weight ration of 26:1.
- **Armour Protection:**
 - (a) Composite Armour.
 - (b) Explosive reactive armour.
 - (c) NBC protection system.
- Additional feature includes Integrated Battle Field Management System (IBMS).



Armoured Personnel Carrier Factory:

Established in 1992. Manufactures APC M113P, APC Talha and different variants of APCs with a capacity of 150 APCs per year. APC Factory has absorbed the technology to manufacture APCs and has also been able to develop APC Talha and Saad. APC Saad has been designed and developed as a defence product and is equipped with state of the art systems. APC Saad has enhanced power to meet the dictates of modern battle field.

The main features are as under:-

- 408 HP Diesel Engine



APC Talha

- Automatic Transmission
- Enhanced Mobility
- Enhanced Armour Protection
- NBC Protection System
- Air Conditioned



Gun Manufacturing Factory:

Established in 1992 with a capacity to manufacture 50 tank guns per year. Gun Factory has the capability of producing smooth and rifled gun barrels ranging from 105mm to 203mm caliber. Each barrel is processed through precision machining operations and subject to stringent quality control parameters. Presently manufacturing 125 mm smooth bore Tank Gun for tank Al Khalid and Al Zarrar.



Surplus Capacity Utilization:

Manufacturing factories are utilizing surplus capacity to manufacture Security Vehicles, Discreetly Armoured Vehicles and Security Equipment.



Allied Facilities:

DESCOM: The Development Engineering Support and Component Manufacture (DESCOM) is the factory implementing deletion plan through indigenization. This includes manufacture of in-house items and development of parts and components through down stream industry.

- 39,800 variety of items are being manufactured through In House Manufacture facilities.
- Factory also engages Pakistan's down stream industry for manufacture 58,900 variety items.

AARDIC: Advance Armour Systems Research and Development, Information & Integration Centre (AARDIC) is engaged in development of following systems of tanks:-

- Integration of IBMS in Tank Al Khalid.
- Universal Fire Control System for 125 mm tank guns.
- Dynamic Muzzle Reference System.
- Auto Tracker Tank Al Khalid.
- NBC Systems for tanks, APC/M102A2.
- Remote Controlled Weapon Station.
- Bomb Blanket for Toyota Land Cruiser, Defender D-90 and Defender SW-110.
- Development of body armour.



ACHIEVEMENTS

HIT, by the grace of Almighty Allah achieved not only the assigned tasks but also executed various new development concepts in the field of Tanks, Armoured Personnel Carriers (APCs) and Armoured Recovery Vehicles (ARVs), Security vehicles and equipment. All these projects have been accomplished within the targeted time frame. The production progress during financial year 2010-2011 is as under:-

Rebuild / Upgradation Projects **Quantity**

➤ Upgradation of Al Zarrar Tanks	-	50
➤ Upgradation of ARV W653 to W653A	-	10
➤ Rebuild of T-Series (T-59/T-69) Tanks	-	09
➤ Tank Engines	-	103
➤ Rebuild of APCs (M113 A1/A2/P)	-	60
➤ APCs Engines	-	18
➤ FCS/GCS	-	352
➤ MUAs, assemblies and components	-	3548
➤ 125 mm Tank Gun Rebuild	-	03

Manufacturing Projects

➤ APC M113P	-	06
➤ Generators – 600/500/70/50 KVA	-	02
➤ TI Sights	-	85
➤ BS Wpn Carr (Maaz)	-	14
➤ APC Talha	-	02
➤ Security Vehs Mohafiz	-	57
➤ 125 mm Tank Gun Barrels	-	28
➤ 125 mm Tank Guns	-	50

INDIGENIZATION

All HIT projects are subjected to time based deletion plan through indigenization. This includes manufacture of in-house items and development of parts and components through down stream industry. The achievements for year 2010-11 are as under:-

Ser	Products	<u>No of Varieties of Parts Manufactured</u>	
		In house Manufacturing	Through down stream Industries
a.	Tank Al-Khalid	15	08
b.	Tank Al Zarrar	132	106
c.	Tank T-85IIAP	53	85
d.	Tank T-80UD	06	-
e.	T 59/T69 IIMP	39	-
f.	APC Saad	05	16
g.	ARV W653/653A	58	63
h.	125 MM Gun	56	-
j.	Security Vehicle Mohafiz	18	-
k.	580 / 730 HP tank engines	78	04

Indigenous Effort Benefits:

Through value addition, HIT is contributing approximately Rs. 3.8 billion annually towards the overall saving beside generation of economic activity through the down stream private/vendor industry.

COMMERCIAL ACTIVITIES

HIT is pursuing commercial activities utilizing its surplus capacity for manufacturing of marketable products for export and domestic sales under HIT board Act. Some of the commercial products manufactured in year 2010/11 are as under:-

<u>Ser</u>	<u>Products</u>	<u>Factory</u>	<u>Quantity</u>
a.	Security Vehicle Mohafiz	TM (F) & APC (F)	59
b.	Discreet Armouring of Vehicle	TM (F)	57
c.	Bullet Proof Jackets (BPJ)	AARDIC	2843
d.	Bullet Proof Vests	AARDIC	532
e.	<u>Other:</u>		
	➤ Generator	HRF (M)	2
	➤ 125 mm Barrel	Gun (F)	1
	➤ Portable Gun Cleaning System	Gun (F)	1
	➤ Chrome plating of plungers	Gun (F)	6

Commercial Products:

Security Vehicles:

Mohafiz – I, II: The main features are as under: -

- Platform - Land Rover Defender (122 HP).
- Torque – 360 NM
- Manufactured with Ballistic steel or Aluminium – steel combination with rotating turret.
- Protection level - B6
- Seating capacity - 8
- Firing ports - 6
- Run flat tyres.
- Additional features include Jammer for GSM.

Mohafiz-I



Mohafiz-II

Mohafiz – III: Mohafiz-III is being developed with following addl features:-

- Platform - Toyota LC 79 (200 HP Engine)
- Torque – 430 NM
- Protection level - B7
- Improved suspension and brake system



Mohafiz-III

Troop Carrier (MRAP Buraag): Mine resistant Ambush Protected (MRAP) developed with following main features: -

- Monocoque Shell structure with IED protection.
- Protection level - B7 and above
- Blast Protection - 14 kg of TNT
- Counter Mine Tyres
- Carrying capacity - 12 Persons
- Rear view camera - Available with LCD screen
- Smoke Grenade/Launcher - 4 (2 at front and 2 at rear)



Security Equipment:

Armoured Guard Post (AAHAN): The main features are as under:-

- Customized design
- Protection level B6 or B7
- Protection against blast and fragmentation
- Bullet proof glasses
- Rotating Turret
- Firing ports



Bullet Proof Jacket (Hifazat): Main features are :-

- Weight - 6 kg
- Size - Available in all sizes
- 5Colour - As per user requirement
- Protection - NIJ level III & IV
- Protected area - Front and back, collars Shoulder
- Material - Fire retardant, floatable, chemically inert



Discreetly Armoured Vehicles: Main features are as under:-

- Protection B5 / B6 / B6 + level
- Blast protection upto DM51 standard and above
- Bullet proof front, rear and door glasses
- Improved brake system
- Improved suspension system
- Run flat tyres



Benefits of Commercial Activities: HIT has significantly contributed in government treasury through exports and domestic sale of APCs, Security equipment/ vehicles and discrete armouring of vehicle. Salient are as under:-

- | | | |
|--|---|--------------------|
| ➤ Total sales in FY 2010/11 | : | Rs. 1611 Million |
| ➤ Profit earned for Government | : | Rs. 426 Million |
| ➤ Proportionate cost remitted to Government as per rules | : | Rs. 89.253 Million |
| ➤ Remittance under process | : | Rs. 59.323 Million |

PAKISTAN AERONAUTICAL COMPLEX KAMRA

Pakistan Aeronautical Complex Kamra is an Organization which comprises four co-located factories which virtually take care of maintenance of all operational assets of Pakistan Air Force for the purpose of effective control and efficient working. Production Statistics of the four Factories for the last Fiscal Year are tabulated below:-

Mirage Rebuild Factory (MRF):

(a)	Mirage A/C	:	11
(b)	ATAR 09C Engine	:	106
(c)	ATAR Engine Accessories	:	9986
(d)	ATAR Jet Pipe / Junction Section	:	70
(e)	F-100 Engine / Modules	:	38
(f)	F-100 Accessories	:	391
(g)	T-56 Engine	:	07
(h)	T-56 Engine Accessories	:	783
(j)	J-69 Engine Parts	:	879
(k)	MPR Modification	:	04

F-6 Rebuild Factory (F-6 RF):

(a)	GOH aircraft production	:	45
(b)	GOH component production	:	67,563
(c)	C-130 aircraft propellers overhauled	:	07
(d)	Drop tanks repaired/overhauled	:	121
(e)	Hardware and rubberized parts manufactured	:	3,27,030
(f)	Mirage AME Refurbished	:	106

Aircraft Manufacturing Factory (AMF):

(a)	Retrofit III of Mushshak aircraft for PAF	:	05
(b)	Small assemblies	:	281
(c)	Spares Support to PAF & Pak Army	:	882

Kamra Avionics and Radar Factory (KARF):

(a)	Rebuild of Mobile Pulse Doppler Radars	:	04
(b)	Rebuild of TPS-43 Sensor	:	01

- (c) Refurbishment of Radio Relay Vehicles : 04
- (d) Refurbishment of Air Conditioners : 16
- (e) Life Cycle Maintenance of Avionics LRUs & SRUs of Grifo 7, Grifo PG & Grifo M3 Radars : 1110

Significant Achievements:

The achievements of respective factories of PAC, Kamra during the period of report are highlighted in the subsequent paragraphs.

Mirage Rebuild Factory (MRF):

The following projects were accomplished by MRF during the period under review:-

- (a) **Surveillance Audit of MRF:** 1st Surveillance Audit of MRF on ISO & AS 9100 Standard was concluded by Aerospace Lead Auditor of ISA (Inc) USA in the month of March, 2011. The overall score of MRF is 96.6% on the basis of assessment result and scoring, Aerospace Lead Auditor has recommended continuation of MRF Certification on AS 9100 Rev 'B' Standard.



Mirage Jet Fighter

F-6 Rebuild Factory (F-6RF):

The following projects were accomplished by F-6RF during the period under review:-

- (a) **Indigenization Task Development:** A significant number of indigenization tasks were accomplished at F-6RF. This includes Engine Symmetry Fixture, Holding Fixture for Hydro Filter, Deviation of Auxiliary Inlet Covers and Safety Pins for Drop Tank in respect of F-7 aircraft. Additionally, 04 Structural Parts of C-130 aircraft and a special Coupling Shaft were also produced indigenously during 2010-2011.

(b) Important studies / Reports / Draft TCTOs Areas of 2011:

- Study on accomplishment of scheduled and Life Extension Inspection of Y-12 A/C
- Study on Engine System and Fuel System, Landing Gear System and Hydraulic System Hygiene
- Integrated study on replacing of Ejection seat (Chinese of (FT-7P) aircraft with MB Seat PK-10LV of A-5III retired aircraft

(c) Projects Completed: Following major tasks were also accomplished during the period under review:-

- Manufacturing of JF-17 Ejection Seat parts
- Manufacturing of BDU of Mirage
- Mirage A/C ERUs overhauling project



Aviation Hardwares

(d) On-going Specialist Projects:

- Manufacturing of FALCO Parts
- Manufacturing of BDU Shell
- Establishment of CoE for Canopies



FALCO Unmanned Aerial
Vehicle System

Aircraft Manufacturing Factory (AMF):

The following achievements were made by AMF during the period under review:-

(a) JF-17 Airframe Co-Production Project: The Final Assembly and FTS work of JF-17 aircraft entered into sustained production phase during the period of report. Following the successful completion of ToT phase, a total of 22 SP aircraft underwent Final Assembly during the period of report. 11 aircraft have been delivered to PAF in the period under review, including five spill over from year 2009-10. Qty 06 aircraft are in final stages of FTS work before delivery to user and Qty 05 aircraft are currently undergoing Final Assembly.



JF-17 Thunder

(b) Manufacturing of K-8 Small Assemblies & Front Fuselage: AMF has already acquired capability for manufacturing Horizontal Tail, Vertical Tail, Engine Cowling and Front Fuselage of K-8 Aircraft, through phase wise transfer of technology program. AMF has manufactured 281 small assemblies and 13 Front Fuselages till December, 2010 for China. Final shipment of K-8 assemblies was dispatched to China in March, 2011. CATIC has been asked to download more work load for K-8 manufacturing facilities at AMF.



K-8 Jet Trainer

(c) Indigenous Development, Repair and Up-gradation on Super Mushshak

Aircraft: Up-gradation of PAF Mushshak aircraft to Super Mushshak aircraft has been completed by June, 2011. 59 line items were developed for SMK aircraft. Additionally, 24 Wings and 07 Fuselages of PAF & Pak Army SMK aircraft were repaired.



Super Mushshak Trainer

Kamra Avionics & Radar Factory (KARF):

Other than the routine yearly production, following are the major projects completed during the period under consideration:-

(a) Quality Management System: Quality Assurance is always striving to adhere to all applicable requirements in order to ensure continual improvement in our products and processes. Implementation of Quality Management System (QMS) is being done in true letter and spirit. To achieve customer satisfaction, the organization is periodically audited; annually for Surveillance Audit and, after every three years for re-certification audit. The recently Surveillance Audit was conducted in April, 2011 by ISA (International Standard Authority) USA. The quality management system shall be graded to AS9100-C during next certification audit to be held in 1st Qtr of year 2012.

(b) Support of PAF Bases: Following is the detail of support provided to PAF Bases:-

(i) Training Workshops: Interactive training workshops were conducted at Grifo operating Bases / Squadrons. During which Task Oriented Training (TOT) was imparted to Engineering Officers and Technician working on Grifo Radar.

(ii) **Provisioning of Upgraded Test Rig:** In order to enhance 'I' level testing facility at Bases, Grifo-7/PG Radar Test Rig qty 01 with flight software downloading facility has been successfully developed locally. Test Rig has been handed over to PAF Base, Mushaf.

(iii) **Successful Trial Repair of Altitude Display Indicator (ADI) of F-7P Aircraft:** ARC Directorate successful repaired Qty-05 Part No 751080-1 Attitude Display Indicator (ADI) with unserviceable Power Supply / Control Board and Mother Board Assy. The system could not be readily repaired due to non-availability of any spare stock and any depot level tester or documentation. All LRU's were successfully repaired to meet PAF urgent operational requirements. This resulted in saving of huge amount of FE besides saving significant turn around time.

(iv) **Avionics Support to PAF:** KARF provided support to PAF during various operational exercises.

(c) **PME Calibration and Repair:** A total of 2037 items were calibrated while 21 items were repaired at PMEL KARF.

(d) **Addition of New Capability:** The following new capabilities have been achieved by KARF.

(i) **Establishment of Production Facility for Global Attitude Heading Reference System (GAHRS):** GAHRS production facility was established in March, 2011 with installation / commissioning of 3-Axis Rotation Table, Single Axis Rotation Table and Temperature Chamber. Production of 21 sets have been completed till June, 2011.

(ii) **Establishment of Environmental Stress Screening (ESS-II) Facility:** The ESS-II facility has been established at KARF JF-17 production facility with installation and commissioning of 07 Chambers in January, 2011.

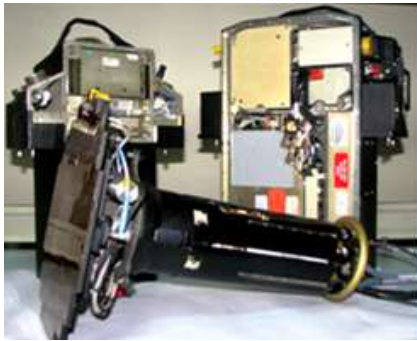
(iii) **Establishment of Facility for KLJ-7 Radar Co-production:** Installation and commissioning of facility for KLJ-7 radar co-production was started on 03 June, 2011. It includes establishment of System Level Test Station (SLTS), Environmental Stress Screening (ESS), Packing and

Microwave absorption facility. Installation and commissioning of Packing Facility has been completed. Following phases of system are completed/under progress.

(A) LRU Phase Training completed (25-02-11 to 08-04-11)

(B) SKD Phase Training is under progress

(C) LRU Phase commissioning and SAT in progress



Avionic System – Grifo Radar



Mobile Pulse Doppler Radar



Airborne System

KARACHI SHIPYARD & ENGINEERING WORKS LIMITED

Vision:

To make Pakistan a leading shipbuilding country of the region, in line with its true potential and ideal location, thus contributing towards our economic development and poverty alleviation

Mission:

KSEW is committed to deliver quality products built to agreed specifications on scheduled dates and at competitive prices.

Introduction:

The Karachi Shipyard & Engineering Works Limited (KSEW) is a public limited company, with all shares owned by the Government of Pakistan / Pakistan Navy. It is an autonomous body under administrative control of Ministry of Defence Production. The KSEW is situated geographically within the boundaries of Karachi Port, covering an area of 65 acres (approx). The set up has been designed and built to undertake construction & repair of small to medium size ships and to undertake heavy engineering activities. It was built with the technical assistance of H. C. Stulcken Schon of Germany, in 1956.

Main Functions:

➤ **Pakistan Navy's Requirement:**

As per Government's mandate KSEW caters for Pakistan Navy's requirements as PAC KAMRA and HIT cater for PAF and Pak Army's requirements respectively.

- Additionally, KSEW undertakes commercial activities mainly, Shipbuilding, Shiprepair and General Engineering.

➤ **Shipbuilding:**

➤ **Commercial:**

KSEW is equipped to build all types of Marine Crafts, Motor Cargo Vessels, Container Ships, Oil Tankers, Bulk Carriers of up to 26,000 TDW, Harbour Tugs, Pilot Boats, Hopper Barges, Dredgers and Launches etc.

➤ **Military:**

- F22P Frigate for Pakistan Navy is under construction at KSEW in collaboration with CSTC of China, alongwith ToT.
- It has also been decided that as against few sub-sections of Agosta 90B Submarine which were made at KSEW, all new Submarines for PN will be completely built at KSEW. KSEW now has the needed expertise and the project will likely to be executed in collaboration with OEM.
- KSEW already has the capability of indigenous construction of Fast Attack Missile Crafts, Patrol Boats, Gun Boats & Missile Boats size ships. Quite a few vessels have been built and supplied to PN as well as to international clients
- To support this shipbuilding activity, KSEW houses three Ship building berths with the following sizes & capabilities :-

<u>BERTH NO.</u>	<u>SIZE</u>	<u>MAX. TDW.</u>
1.	169 X 23 M	15,000
2.	118 X 23 M	6,000
3.	213 X 31 M	26,000

➤ **Major Products:**

F22P Frigate:

A multi mission conventionally powered Frigate, having displacement of 2800 tons and designed for a maximum speed of 29 Knots.



F22P FRIGATE

Agosta 90B Submarine:

Agosta 90B is a modern conventional submarine built for Pakistan Navy under Transfer of Technology from DCN of France. During this program Engineers of Pakistan Navy and Karachi Shipyard obtained extensive training in France for construction of submarines. The Agosta-90B Submarine can be fitted with MESMA, an Air Independent Propulsion System that increases under water endurance during operations at Sea.



AGOSTA 90B SUBMARINE

Fast Attack Craft (Missile):

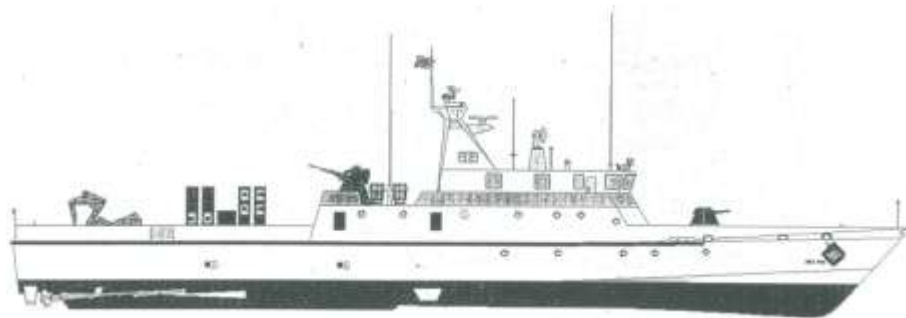
Fast Attack Craft (Missile) fitted with the most modern Missile System. The craft has a designed speed of 32 Knots and a maximum displacement of 250 tons. Fitted with C-802 Surface to Surface Missiles, the boat makes a lethal platform at sea.



FAC(M)

500 Ton Fast Attack Craft (Missile) FAC (M):

KSEW has signed agreement on 30 Jun 2010 with China Shipbuilding & Offshore Company for the construction of FAC (M) for Pakistan Navy.



The FAC (M) will be single bottom flush deck craft, propelled by 04 sets of propulsion system. The craft is designed for max speed of 30 knots at full

displacement. Length, breadth and depth of the craft will be around 60m, 8m and 4.3m respectively.

FAC (M) will be equipped with the missile system and other weapons / combat systems to attack hostile targets by SSM and Naval guns, attacking air targets, conducting surveillance of the coastal economic zones and rescue & search operations.

Floating Docks:

State of the Art Floating Docks indigenously constructed at KSEW. Built in various sizes ranging from 1000-4000 tons lifting capacity, these docks provide extremely sophisticated mini dockyard facilities at point of choice. The facility is extremely useful for ports not having Dry Docks, can be towed and parked at small ports for use as required.



FLOATING DOCK 4000 TONS

Shiprepair:

- Good facilities exist in KSEW for undertaking all types of above water and under water repairs of ships and offshore drilling rigs. KSEW Shiprepair Section is organized to undertake above water repairs of vessels within KSEW premises, in Karachi Harbour and at the outer anchorage (if required). Uptill now, KSEW has repaired over 5000 Ships, including foreign flag carriers and warships belonging to France, Iran, Oman, Yemen and Royal (UK) Navies.
- For under water repairs, two Dry Docks are available, which can take vessels upto 26,000 TDW.

<u>DRY DOCK</u>	<u>LENGTH X WIDTH</u>	<u>CRANE (TONS)</u>	<u>MAX. TDW.</u>
1.	186 X 27 m	30 & 10	26,000
2.	170 X 24 m	15 & 10	18,000



Ships under repair at KSEW

- A 500 Meters Quay Wall is available on the northern end and 165 Meters on the southern end for maintenance/berthing of vessels and above water repairs.

General Engineering:

The Engineering Division undertakes construction of Package Type Fire-tube Boilers of upto 600 HP - 250 PSI, Water Tube Boilers upto 80 tons/ hour, Pressure Vessels, LPG Tanks, Heat Exchangers, Storage Tanks of all sorts, Gates for Dams, Barrages & Head Works, Conveyors and Elevators for Chemical, Petroleum and Cement Industries, complete Sugar Plant 4000 – 5000 TCD capacity, Sugar Mill Machinery, all types of Cranes, Steel Structures and Towers, Caravans, Overhead Steel Bridges and Sewage Treatment Plants etc.

General Engineering Products:



Sewage Treatment Plant



LPG Storage Tanks



Fire Tube Boilers



FRP Tanks



Wind Turbine Towers

Achievements/Progress During the year (2010-11):

Ship Building:

Orders Completed During 2010-2011:

- 02 x Small tankers Cum Utility Ships (STUS) for PN delivered to PN on 29 April 2011.

Orders in Hand:

- 4th F22P Frigate for Pak Navy is being constructed at KSEW and was launched on 16-06-2011 successfully. Remaining outfitting work on the vessel is in full swing and F22P Frigate will be delivered to PN before its contractual time frame.
- Construction work of 02 x Pusher Tugs and 01 x Dredge Tender at KSEW for Karachi Port Trust is in full swing and vessels will be delivered to KPT as per schedule of the contract.
- Construction of 01 x 500 Ton Fast Attack Craft (Missile) for Pakistan Navy has been started and Steel Plate Cutting Ceremony was held on 12-07-2011.
- Construction of 02 x 500 Ton capacity Flat Top Barges for KPT has been started at full swing and project is being headed towards completion.
- Construction of 02 x Pusher at KSEW for Pakistan Navy has been signed on 30-06-2011 at a total cost of Euro 2,804,700 plus Rs. 135,200,000/-.

Shiprepair:

- The Shiprepair Section of KSEW undertook repairs of over 23 vessels of various clients such as PN, KPT, PQA, MSA including two foreign flag vessels each from China & Denmark during the year 2010-2011.

Orders Under Negotiations:

- Maintenance works of varying degrees on vessels belonging to PN, PNSC, MSA, KPT and PQA, including 200 Boats for Karachi Fish Harbour Authority and 100 Fishing Boats for Baluchistan are under active negotiations.

General Engineering:

Orders Completed during 2010-2011:

- Flood Light Tower for DHA Sports Complex for Pakistan Defence Officers Housing Authority, Karachi.
- Bending of Steel Plates for Automobile Corporation
- Stress Relieving of Vessels for SEFEC.
- Repair of Mill Head Stock (1Set) for Matiari Sugar Mills Ltd.
- Stress Relieving of Vessels for SEFEC
- Machining of Motor Armature for PN Dockyard
- Machining of Rotor for Siemens Pakistan
- Machining of Sleeves for Lotte Pakistan PTA Ltd.
- Load Testing of Dock Lift System at 600 Tons Load at PN Dockyard.
- Repair of Rotor & Bearing Shield for Siemens Pakistan
- Machining of Rotor for Siemens Pakistan.
- Blocks for F22-P Frigate & STUS (Small Tankers Cum Utility Ship)

Orders in Hand:

- Repair / Refurbishment of X-Craft Hoisting / Lowering Trolley and Associated Infrastructure at PNS IQBAL PN Dockyard Karachi.
- Head Stock Repairing for M/s. Khairpur Sugar Mills
- Head Stock Repairing for M/s. Matiari Sugar Mills
- Machining of Tube Sheet for M/s. Byco.
- Refurbishment of 30 Tons Capacity Level Luffing Crane for Ship Repair Division KSEW.
- Manufacture of Caisson Dry Dock No. 1 of Ship Repair Division KSEW.
- Manufacture of 30 Feet High Security Watch Towers for KSEW.
- Manufacture of Pedestrian Steel Bridge b/w Supervisors Canteen and 1st Floor over KSEW Central Laboratory.
- Manufacture of Steel Roof Trusses for SWCD & Pre-Fab Shops of KSEW.
- Manufacture of 02 Nos. 500 Tons Capacity Cargo Barges for M/s. Karachi Port Trust.

Future Projects

- 15/7.5 Ton Luffing Crane for PN Dockyard
- Fabrication of 200 Tons Capacity Steel Weigh Bridge for M/s. KPT.
- Manufacture of TRASH RACKS for 1st IPP Hydropower Plant of M/s. LARAIB ENERY at outlet of Mangla Dam.
- Manufacture of Floating Bulk Head for Stop page of water for repairing of sill Beams and allied components.
- Manufacture of Platform and Steel Structure for Ship Lift and Transfer System
- Manufacture of TOWERS and allied components for WIND POWER PORJECTS.
- Head Stock Repairing for various Sugar Mills.
- Dump Hopper Barges for Various Clients
- Blocks for Fast Attack Craft.

Saving Through Indigenization:

Shipbuilding and Shiprepair are capital intensive business. Out of the work handled at KSEW considerable amount of foreign exchange has been saved during 2010-11.

Capacity Building/Yard Upgradation:

In order to enhance capacity and to handle production on modern lines, KSEW is going through extensive upgradation which includes civil works pertaining to construction project of F22P Frigate, repair / refurbishment of dry docks and installation of ship lift & transfer system. The project of Ship Lift and Transfer System has a capacity to lift ship and submarines having displacement upto 7,500 tons. There are 13 repair stations in the Master Plan. Once completed, this facility will take care of repair / maintenance requirements of domestic market completely as well as the foreign flag ships would also be accommodated. This upgradation worth billions of Rupees will Inshallah convert KSEW into a state of the art Shipyard which should be able to compete with the similar size yards in the international market.

Financial Performance / Revitalization:

After a rather weak performance of over a decade, KSEW is back on even keel. Financial restructuring duly supported by GoP revival package has provided a new lease of life. KSEW has become self sustaining and as against in the past, seeks little help from the Govt. It is now meeting its all expenses including land rent etc out of its own earnings. This will also provide KSEW a much needed capability to enter the international market.

NATIONAL RADIO AND TELECOMMUNICATION CORPORATION

National Radio and Telecommunication Corporation (NRTC) is engaged in design, development and manufacture of telecommunication equipment in Pakistan. NRTC is the pioneer in Telecommunication Equipment and leader in the field of communication in Pakistan for the last four decades. NRTC is producing high quality products for Defense services, Pakistan Telecommunication Corporation (PTCL) and other civil / military Organizations since 1965-66.

By virtue of long experience in the field of telecommunication, NRTC has attained excellent technical backed-up knowledge and support with a modern infrastructure and standard expertise required to produce telecommunication equipment to the entire satisfaction of the users. We are ISO-9001-2000 and IPC Certified as well.

Location:

It is situated in T&T Complex Haripur (NWFP) Pakistan, which is 80 Km North West of Islamabad.

Quality Policy:

- To provide our customers world class quality Radio and telecommunication equipment which meets all their operational requirements, in time, at affordable costs.
- User's satisfaction must be given top priority by each employee in the process chain, from receipt of raw material, through manufacture and delivery, till final acceptance.
- Employees performance must achieve the aim and delight the customers through continual improvement by supplying quality product.
- Each product must qualify the user's inspection and test, the first time, every time

MAIN PRODUCTS MANUFACTURED BY NRTC

ELECTRONIC FIELD TELEPHONES



EFT-101



RAFT-786

LAND MOBILE RADIO



LMR-BASE STATION



LMR-MOBILE RADIO



LMR-PHONE PATCH



LMR-REPEATER



LMR-HANDHELD



96000 SERIES RADIO SET



EXCHANGE 64161

**Ni-Cd BATTERIES AND DUAL Ni-Cd
BATTERY CHARGER**

DUAL BATTERY CHARGER



4AH/13.2V BATTERY
FOR AN/PRC-77

4AH/14.4V BATTERY
FOR PRC-9610



PERSONAL ROLE RADIO



POWER SUPPLY HIGH RATING



PRC-77/PK VHF-FM RADIO SET

TECHNICAL PERFORMANCE / CAPABILITIES

NRTC has the following technical facilities/capabilities for the Manufacture, Assembly, Testing and Measuring of following equipment/tasks:-

- HF and VHF Military Version Radios.
- VHF and UHF Commercial Mobile Radios.
- VHF and UHF Single/Dual/Multi Channel Extend Radios.
- Military Version Switches/EPABXs 16 lines, 20 lines, 40 lines and 96 lines.
- Commercial Version Switches/EPABXs 50 lines to 1024 lines.
- Digital Field Telephone and Ruggedized Auto Field Telephone.
- Linear, Regulated Power Supplies.
- Printed Circuit Boards for all type of Telecommunication equipment.
- DP Boxes, Cabinets and other accessories of out side plants.
- VHF/UHF Antennae for Military/Commercial Radios including Extend Radios.
- Environmental Test facilities as per MIL-STD-810E
- PCB stuffing upto 8-layers

MAJOR PROJECTS 2000-2011

Following are major projects for the last nine years:-

- Local Manufacturing of VHF Frequency Hopping Radios (9600 Series)
- Up-graded PRC-77 Radios
- Automag 4+12 lines
- Digital Electronic Field Telephone Exchange PFX-6416
- Digital Electronic Field Telephone Exchange PFX-3208
- Digital Electronic Field Telephone Exchange PFX-1204
- Field Auto Telephone Exchange PFX-1604
- Electronic Field Telephone (EFT-101)
- Ruggedized Auto Field Telephone (RAFT-786)
- DP Boxes

- Cross-Connection Cabinets
- Power Supplies
- Walkie Talkies
- Dual Battery Charger
- Inter Trench Communication (ITC 2000)
- Antenna RC-292
- Land Mobile Radios (SK-2 System)
- Software Defined Radios (SDR)

FUTURE PROJECTS AND TARGETS

Following are the future manufacturing potential projects:-

- Software Defined Radio (SDR)
- SQUAD Radio 5712 – PRR (Personal Role Radio)
- Land Mobile Radio System (SK-2 System)
- Exchange PFX-1604
- IP Based Military Exchanges
- Ruggedized Auto Fd Telephone (RAFT-2050 Mil)
- Rapid Dual Battery Charger (Solar)
- Rapid Multi Battery Charger
- PFX-3208 Field Telephone Exchange.
- Un-Interruptible Power Supplies (UPS)
- Energy Savers
- Alternative Energy Solutions
- IP Security Gateway (Network Security)
- Secure Phone / Fax / Data Device
- IP Encryptors
- Bulk Encryption Units
- Secure Data Links
- Radio Intercom System for APC's and tanks

NRTC is also planning to get access to the other segments on telecommunication market both for Defence and Commercial Sectors.

DIRECTORATE GENERAL DEFENCE PURCHASE

Financial Year 2010-11 like previous fiscal yr was eventful and rewarding from proc pt of view. In depth analysis of entire proc activities has been undertaken and a substantial improvement has been observed in all facets. The improvement in output is attributed to wholehearted and well-coordinated efforts put in by all agencies and Orgs, which certainly deserve appreciation. The salients of the achievements are reflected in succeeding paras. During the preceding fin yr proc to the tune of Rs. 1,001,912.551M has been made for the Armed Forces.

Proc Activities:

The summary of proc activities for Fin Yr 2010-11 in respect of DGDP, DsP and AsDP is as under:-

PROC ACTIVITIES FY 2010-11

DGDP:

Against SVC Budget:

Indents Received	Crossmandated	Cancelled/Not Concluded	Contracts Concluded
06	-	-	02

PROC ACTIVITIES FY 2010-11 DIRECTORATES OF PROCUREMENT (DPs)

Against Dev Packages:

S/No	Org	Indents Received	Crossmandated	Cancelled/ Not Concluded	Contracts Concluded
1.	DGP (Army)	63	1	16	*50

No contract has been concl by DP (Navy) and DP (Air) against Dev Packages.

Against SVC Budget:

S/No	Org	Indents Received	Crossmandated	Cancelled/ Not Concluded	Contracts Concluded
1.	DGP (Army)	397	06	88	348
2.	DP (Navy)	715	131	250	334
3.	DP (Air)	349	33	45	308
Total:		1461	170	383	*990

* In few cases against 01 x indent two or more contracts have been concl.

To assists in the proc of urgently required stores of those items, which are to be purchased from the supplier abroad or which are not aval indigenously or when the quoted rates are exorbitant, AsDP abroad are tasked for such proc. For this purpose indents are crossmandated by proc agencies to AsDP abroad. Detail of indents crossmandated and cont concl during last fin year is as under:-

**PROC ACTIVITIES FY 2010-11
ATTACHES DEFENCE PROCUREMENT (AsDP)**

Against SVC Budget:

S/No	Org	Indents Received	Cancelled/ Not Concluded	Contracts Concluded
1.	ADP Washington	217	59	159
2.	ADP London	304	104	262 (62 x Partial contracts)

3.	ADP Paris	250	40	139
4.	ADP Beijing	51	31	20
Total:		#822	234	*580

* In few cases against 01 x indent two or more contracts have been concl.

Including 749 x spot purchase indents.

Proc of Maj Def Eqpt:

Maj eqpt proc during last fin yr i.e. (2010-11) by DGDP and its subordinate estb is as under:-

**PROC OF MAJ DEF EQPT
DURING FY 2010-11**

Against Dev Packages:

S/No	Description of Stores	Qty	Contract Value	
			FE	LC
1.	MS-87 HSD 20 K-II Oil JP-1	19.914	-	Rs. 1,499.99M
2.	Bullet Proof Jacket	16,647	-	Rs. 883.630M
3.	Lt Wt Cbt Helmet	60,000	-	Rs. 708.000M
4.	Tent 180 Lbs Modified Complete	7,239	-	Rs. 676.485M
5.	Trk 1 Ton 4x2 Toyota	196	-	Rs. 319.480M

Against SVC Budget:

S/No	Description of Stores	Qty	Contract Value	
			FE	LC
1.	Test Station, Spares, ancillary eqpt & Trading	Various	US\$ 25.00M	-
2.	Refurbished/ Upgraded AIM-9L	02 L/item	US\$ 24.920M	-
3.	WP13 F(B) ENGINES	01/20	US\$ 24.155M	-

4.	Refurbishment/ Upgradation of AIM-9PI/I-1 Missiles	08 L/Item	US\$ 24.069M	
5.	Weapons & Sensors	02 Sys	US\$ 23.440M	-
6.	QW-18 IR SAIM	258	US\$ 18.484M	-
7.	MS-87, HSD 20, HSD 0& K-II Oil	10.721, 64.000, 8.000& 14.445	-	Rs. 7,391.731M
8.	Turbine Fuel Aviation Kerosene Type Grade (JP-8)	100.00 MILL LTRS	-	Rs. 6,487.200M
9.	Turbine Fuel Aviation Kerosene Type Grade (JP-8)	60.433 MILL LTRS	-	Rs. 3,920.410M
10.	Turbine Fuel Aviation Kerosene Type Grade (JP-8)	60.00 MILL LTRS	-	Rs. 3,892.320M
11.	MS-87, HSD 20, HSD 0& K-II Oil	3.000, 7.793, 5.000& 14.445	-	Rs. 2,234.116M
12.	Turbine Fuel Aviation Kerosene Type Grade (JP-8)	30.00 MILL LTRS	-	Rs. 1,946.160M
13.	Turbine Fuel Aviation Kerosene Type Grade (JP-8)	20.00 MILL LTRS	-	Rs. 1,297.440M
14.	DIESEL FUEL AND MONOGRADE MS- 87 (MIN)	12,933,590 LTRS	-	Rs. 1,297.440M

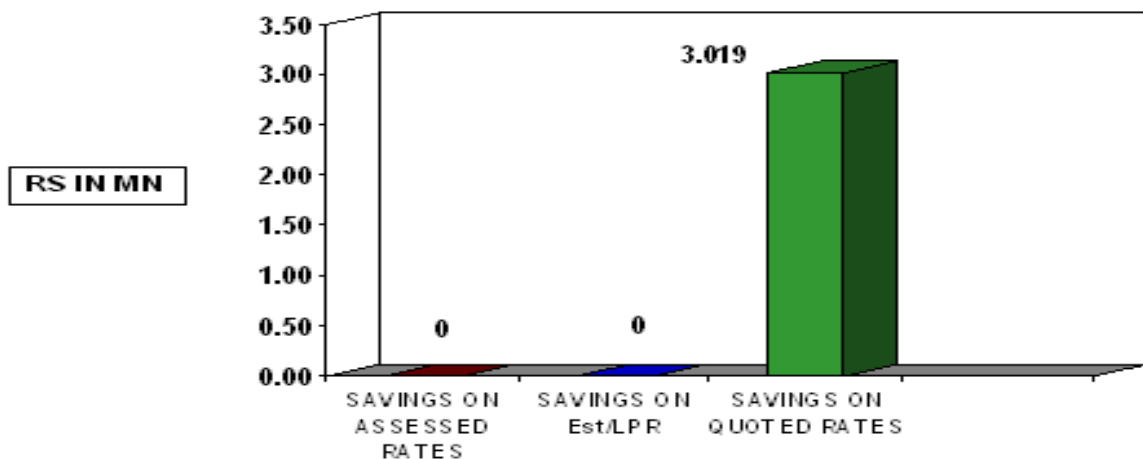
The eco factor remained the hallmark of the fin yr under report. In order to achieve competitive prices, deliberate efforts were made to achieve the desired rates which ultimately resulted in saving millions of rupees to the National Exchequer. The details of saving during fin yr 2010-11 against assessed rates, last proc rates (LPR) and offered rates are as under:-

**SUMMARY OF TOTAL SAVINGS OF CONTRACTS
CONCI DURING FIN YEAR 2010-11**

Against Dev Packages:

Org	Saving Against Assessed Rates	Saving Against User Est/LPRs	Saving Against Quoted/ Offered Rates
DGDP	-	-	-
DGP (Army)	Rs. 128.474M	Rs. 0.541M	Rs. 3.019M
DP (Navy)	No Contract has been concluded by DP (Navy), DP (Air) & AsDP against Development Packages		
DP (Air)			
ADP (Washington)			
ADP (London)			
ADP (Paris)			
ADP (Beijing)			
Total	Rs. 128.474M	Rs. 0.541M	Rs. 3.019M

SAVINGS ACHIEVED – FIN YEAR 2010-11
DEVELOPMENT PACKAGES

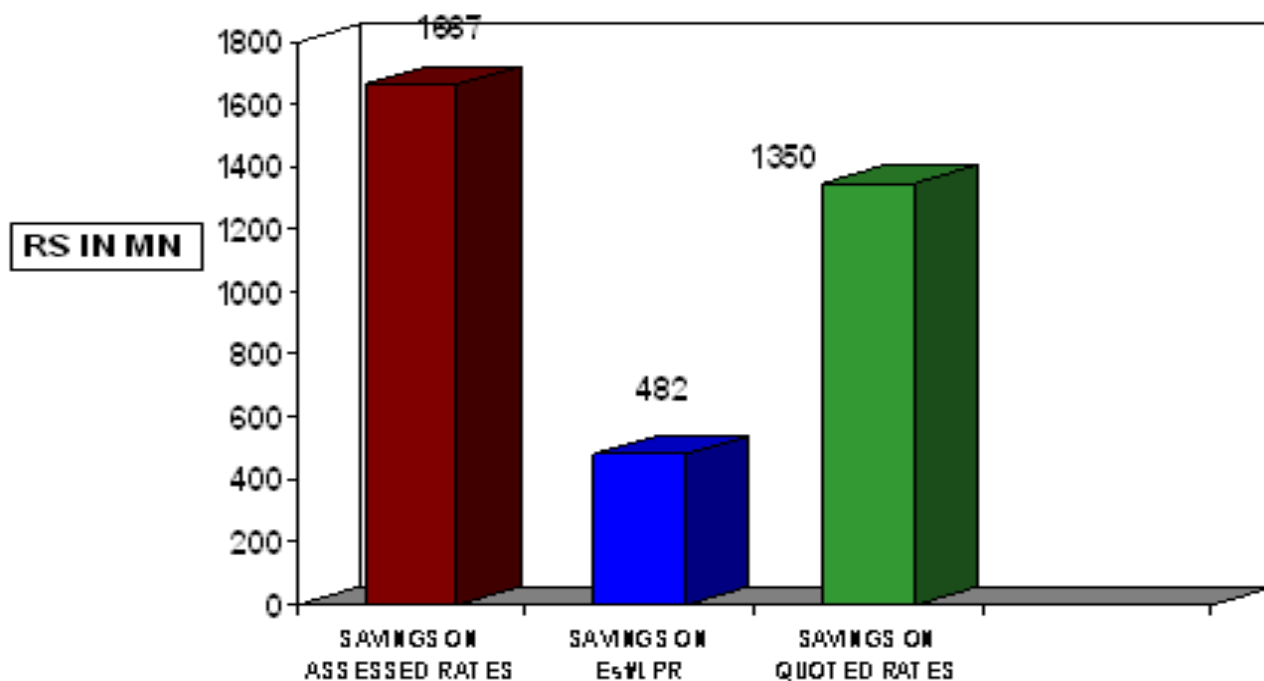


Against SVC Budget:

Org	Saving Against Assessed Rates	Saving Against User Est/LPRs	Saving Against Quoted/ Offered Rates
DGDP	-	-	Rs. 139.728M
DGP (Army)	Rs.1,217.2,084M	Rs. 59.926M	Rs. 101.992M
DP (Navy)	-	Rs. 106.558M	Rs. 55.331M
DP (Air)	Rs. 165.481M	Rs.269.002M	Rs. 954.239M
ADP (Washington)	Rs. 10.984M	Rs. 11.266M	Rs. 1.026M
ADP (London)	-	Rs. 31.916M	Rs. 1.670M
ADP (Paris)	Rs. 270.672M	Rs. 2.725M	Rs. 92.447M
ADP (Beijing)	Rs. 2.987M	Rs. 0.827M	Rs. 3.850M
Total	Rs. 1,667.329M	Rs. 482.22M	Rs. 1,350.283M

*** All figures converted into Pak currency.**

SAVINGS ACHIEVED – FIN YEAR 2010-11 SVC BUDGET



Contracts Concl:

The details of contract concl during the fin yr 2010-11 are as under:-

SUMMARY OF CONTRACTS CONCLUDED DURING FIN YEAR 2010-11

Against Dev Packages:

Org	No. of Contracts Concluded		Value of Concluded Contracts	
	FE	LC	FE	LC
DGDP	-	-	-	-

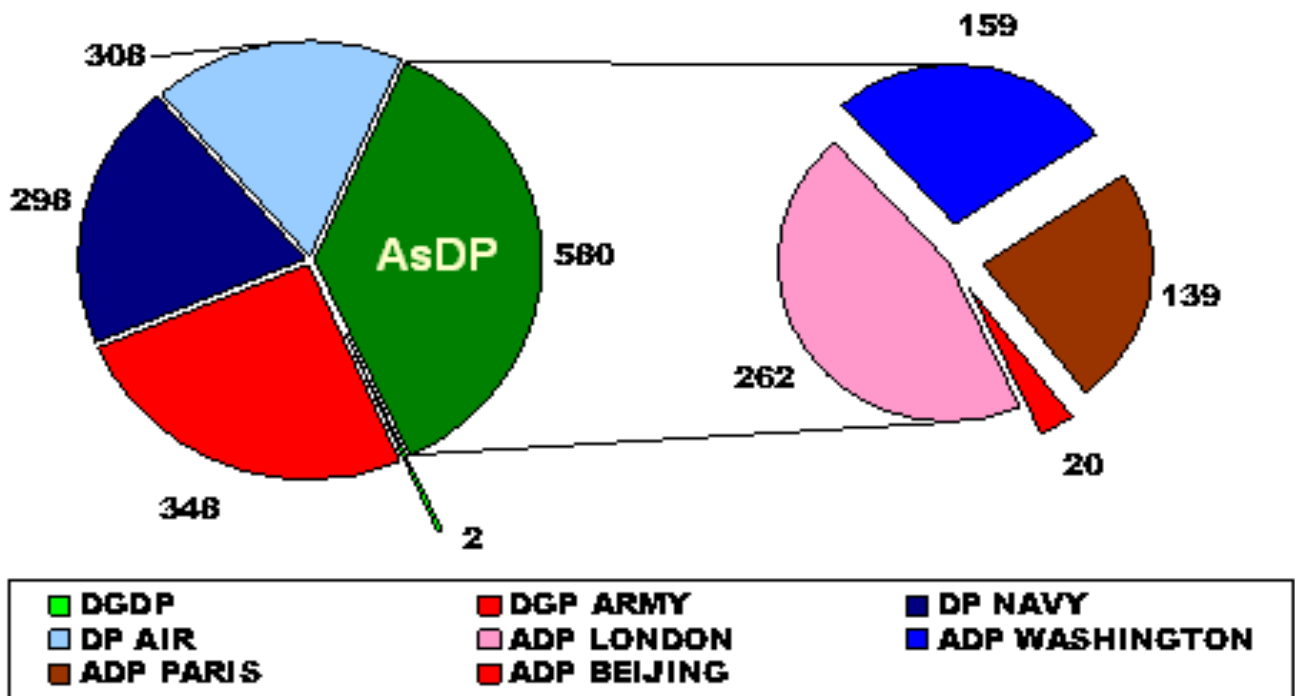
DGP (Army)	07	43	US\$. 6.402M	Rs. 5,632.618M
DP (Navy)	No contract concluded by DP (Navy), DP (Air) & AsDP during Fin Year 2010-11			
DP (Air)				
ADP (Washington)				
ADP (London)				
ADP (Paris)				
ADP (Beijing)				
Total	07	43	US\$. 6.402M	Rs. 5,632.618M

Against SVC Budget:

Org	No. of Contracts Concluded		Value of Concluded Contracts	
	FE	LC	FE	LC
DGDP	02	-	US\$. 23.440M € 0.899M	-
DGP (Army)	87	261	US\$. 67.893M	Rs. 25,693.43M
DP (Navy)	59	239	US\$. 21.057M	Rs. 912,707.00M
DP (Air)	95	213	US\$. 190.888M	Rs. 22,536.780M
ADP (Washington)	159	-	US\$. 1.766M	-
ADP (London)	262	-	US\$. 2.852M € 0.303M £ 2.483M	-
ADP (Paris)	139	-	€ 5.099M	-
ADP (Beijing)	20	-	US\$. 0.327M	-
Total	823	713	US\$. 308.223M € 6.301M £ 2.483M	Rs. 960,937.21M

DIRECTORATE WISE DISTRIBUTION OF CONTRACTS OUT OF SVC BUDGET

DIRECTORATE WISE DISTRIBUTION OF CONTRACTS OUT OF SVC BUDGET



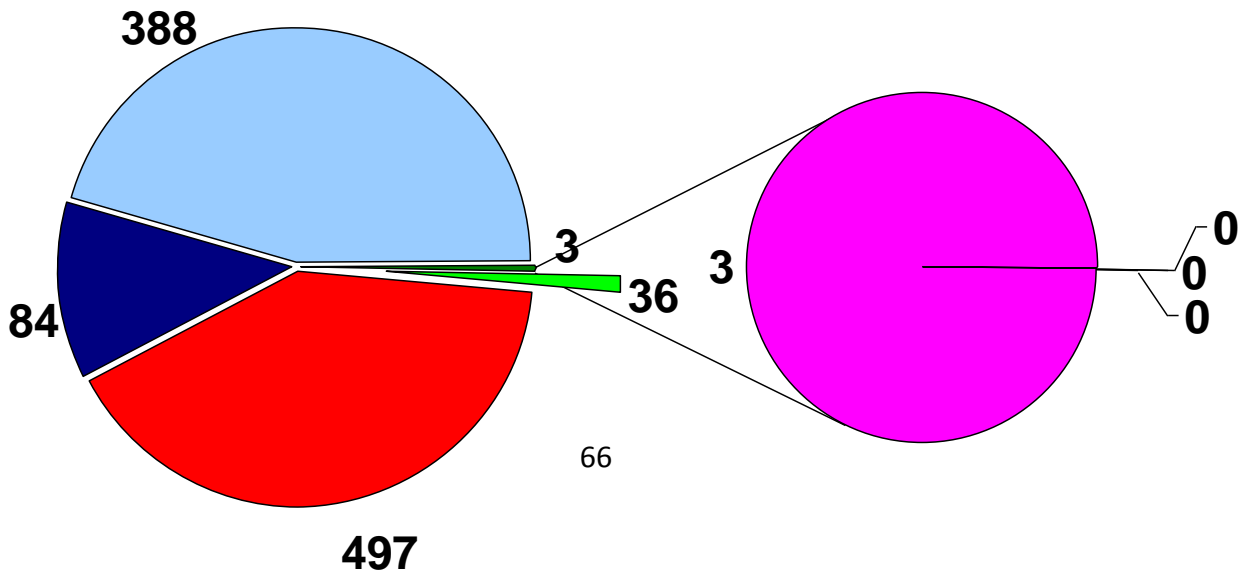
Outstanding Contracts:

Details of outstanding contracts during the period under review are as under:-

DETAILS OF OUTSTANDING CONTRACTS

Org	Total No. of Outstanding Contracts	Total Amount Involved
DGDP	36	Rs. 179,326.000M
DGP (Army)	497	Rs. 17,391.548M
DP (Navy)	84	Rs. 498.474M
DP (Air)	388	Rs. 12,547.993M
ADP (Washington)	-	-
ADP (London)	-	-
ADP (Paris)	-	-
ADP (Beijing)	03	Rs. 3.70M
Total:	984	Rs.30,441.715M

DIRECTORATE WISE DISTRIBUTION OF OUTSTANDING CONTRACTS



Recovery of RE Money:

Details of RE cases alongwith recovery made during fin yr 2010-11 are as under:-

AMOUNT RECOVERED AGAINST RE DURING FIN YR 2010-11

Org	Total No. of Contracts	Total RE Amount Involved (In Rs. Million)	Total Recovery Carried Out (In Rs. Million)
DGDP	-	-	-
DGP (Army)	1,441	1,834.600	0.162
DP (Navy)	7	10.371	-
DP (Air)	112	29.118	-
Total	1560	1874.089	0.162

REGN OF FIRMS

The results of regn activities during the LFY are tabulated as under:-

a.	New firms regd	-	47
b.	Renewal of regd	-	222
c.	Addl indexation of Firms	-	95
d.	Total No. of defaulting firms	-	1

DIRECTORATE GENERAL MUNITIONS PRODUCTION

General:

DGMP is tri Services org, created in 1970 with a view to promote indigenization of Defence equipment through public and private sector to achieve self reliant def industrialization. It has handled projects like indigenous assembly / manufacture of Land Rover Defender Jeeps, Truck 5 ton 4x4 Hino, co-production of Frequency Hopping Radio Sets 9600 Series, Agosta 90-B Submarine and is now engaged with production of F-22 Frigate. It has a long list of other equipment locally developed and delivered to the Armed forces. It also remains in touch with local industry, Chambers of commerce and other business within and outside Pakistan for investment in joint ventures and co-production. To enhance indigenization, all procurements from abroad necessitating Sales Tax Exemptions are processed through DGMP for issuance of STECs (Sales Tax Exemption Certificates). Through its integral R&D Estbs as well as a large pool of vendor industry, DGMP indent and selects projects to be locally dev in close coordination with user Services, thereby saving foreign exchange and developing local industry.

Number of contracts with their total signed during FY 2010-11 (incl u/c Estbs) are:-

a.	Total number of contracts signed	-	40
b.	Value in LC	-	Rs 2862.839356 Mn
c.	Value in FE	-	US\$ 40.486 Mn £ 0.131534 Mn

Major Achievements:

Achievements of DGMP during the year are as under:-

- d.** Assembly /Manufacture of Military Trucks (1/4 Ton to 5 Ton).
- e.** Up-gradation of Radio Sets AN/PRC-77.
- f.** Indigenous development of Surveillance control and Reporting (SCR) System.

- g.** Indigenous development and local production of Software Defined Radios (SDRs).
- h.** Successful system qualification Test (SQT) of MLRs weapon system conducted in Nov 2010.
- i.** Launching of 4th F-22P Frigate being indigenously constructed at KS&EW was held on 16 Jun 2011.
- j.** Pressure hull cutting of PNS//M SAAD to retrofit MESMA-2 was held at PN Dockyard Karachi on 7 Jul 2011.
- k.** Steel cutting of 2nd Fast Attack Craft (Missile) was held at KW&EW Karachi on 12 Jul 2011.
- j.** Air Independent Propulsion (AIP) System MEMSA-2 for installation onboard PNS/M SAAD was delivered FOB by DCNS France on 12 Jun 2011.
- k.** Keel laying of first Attack Craft (Missile), being built at Xingang Shipyard, Tianjin China was conducted on 1 Mar 2011.
- l.** All six Z9EC Helicopters joined aviation fleet of Pakistan Navy.
- m.** Following projects completed successfully in 2010-11 by Dte MP (Air):-

	Project		Qty
(1)	Pyro Locks for R-440 Crotale Missile	-	255
(2)	Explosive Bolts for R-440	-	765
(3)	Interface Control Data monitor	-	04
(4)	Bus Transport Layer Analyzer	-	04
(5)	Oxygen Charging Trolley	-	30
(6)	Mirage Aircraft Servicing Kit	-	06
(7)	Brightness Control Data Monitor	-	57
(8)	Low voltage Power supply	-	62
(9)	PCBs of HUD System LRU (HEU)	-	20

- n.** Following items were also delivered by Dte MP (Air) in FY 2010-11:-
- | | | | |
|-----|--------------------------------|---|----|
| (1) | Hud-956 PCBs | - | 46 |
| (2) | THT Power Supply of HUD VE-110 | - | 02 |

(3)	Deflection Amplifier	-	10
(4)	HUD 106MG PCBs	-	80
(5)	Digital Video Recorder	-	44
(6)	Data Transfer Cartridge	-	40
(7)	MT-7 Battery for Crotale Missile	-	94
(8)	IR Flares for F-16 Aircraft (NDC)	-	1840
(9)	OPS loader	-	08
(10)	Flares FL-4	-	4256
(11)	Isuzu Truck for GPU (NMR-55 Truck)	-	22
(12)	Ni-Cad Battery for CN-235 Aircraft	-	02

Military Vehicles Research Development Establishment:

2. Achievements of MVRDE are as under:-

a. **New Projects:** MVRDE has ventures into non-conventional area of technology as well as simulation, renewable energy technologies etc. Some of recently completed or understudy project including:-

- (1) Main Battle Tank Simulator
- (2) B Vehicle Simulator
- (3) Bio-gas plant for energy generation
- (4) Electric Vehicle
- (5) Hydrokinetic Power Bang
- (6) Solar Battery Charger
- (7) Dip irrigation

b. **Projects Completed:** Following contracts have been completed by MVRDE during the FY 2010-11:-

Projects		Qty
(1) RHA Plates	-	14
(2) Electric Operated Conveyer Belt for use In Ammo Igloos	-	01

(3)	Shelter Mobile Radio Operation Detachment	-	10
(4)	Integrated Dynamic Training Simulator for Tank Al-khalid	-	05
(5)	Integrated Dynamic Training Simulator for Tank Al-Zarrar	-	01
(6)	Indigenous Dev of Driver Simulator for B-Vehicle	-	01
(7)	Static Popup Target system – SPTS	-	01
(8)	Service Trailer	-	20
(9)	Lower Carriage for 37 MM Gun	-	01
(10)	Dual Control Training Vehicle – Car	-	01
(11)	High Pressure Air compressor	-	01

Armament Research Development Establishment:

Achievements of ARDE are as under:-

- a. **Explosive Grid System:** Prototypes for Mesh detonating have successfully been developed by ARDE and different trials were carried out in 2010
- b. **Modified Multi Channel:** ARDE successfully developed Multi Channel comprising of 1 x Master Control Unit and 1 x Slave Unit.
- c. **All Weather Electronics Anti Lifting Device (Modified):** 5x prototypes including electronic circuitry were developed and are currently under inspection with IE&I.
- d. **Simulation Mines (AP):** 100 x Mines were accepted by user. Remaining 400 x Mines have also been developed and handed over to users.

Institute of Optronics:

Following NVDs delivered during FY 2010-011 by IOP:-

	Projects		Qty
a.	Single Tube Night Vision Goggle	-	2986
b.	Aviator Night Vision Goggle	-	17
c.	Night Vision Weapon Sight	-	124
d.	Driver's Night Vision Periscope	-	81
e.	Night Vision Weapon sight NS-685	-	1488
f.	Single tube goggle (STG-SHIBA)	-	80

Submarine Rebuild Complex:

Achievements of SRC are as under:-

- a. SRC Preliminary Design has been finalized and work on Detailed Design is in progress.
- b. 60% work on const of 300 men barrack at Ormara has been completed.
- c. 40% work on const of T-Road around 300 men barrack has been completed.

Geotechnical survey of SRC land completed in Nov 2010.

DEFENCE EXPORT PROMOTION ORGANIZATION

General: Defence Export Promotion Organisation (DEPO) since its inception in 2000 has been promoting the products of public and private sectors defence industries. Details of achievements of DEPO in 2010-2011 are given in the subsequent paragraphs.

Exports Promotion:

- a. The defence export figures for the year 2009-2010 is US\$ 33.662 Million and for FY 2010-2011 will be compiled on receipt from public / private sector.
- b. CDs, DVDs and brochures of public and private Industries of Pakistan were forwarded to DAs(P) of South & South East Asian and Middle East & African Countries for wide publicity in their concerned regions.

Enquiries: Enquiries from following countries were received and forwarded to own public / private sector enterprises during the year 2010-2011:-

- a. Bangladesh
- b. Malaysia
- c. Myanmar
- d. Philippines
- e. Egypt
- f. Nigeria
- g. Oman (Visit of a delegation of an Omani firm ILL to POF Wah was coordinated in July 2010).
- h. Saudi Arabia
- j. Senegal

Foreign Delegations Visit to DEPO: Nil

IDEAS-2010: Govt of Pakistan cancelled the IDEAS-2010 due to devastating flood.

However, brief on few activities of IDEAS-2010 are as follow;-

- a. **Preparation of Soft Launch:** The Soft Launch Ceremony for IDEAS-2010 was held in Pakistan National Council of Arts Auditorium on 26th July 2010. The Prime Minister Syed Yousuf Raza Gilani was the Chief Guest on the occasion. 375 guests attended the ceremony, which included High Ranking Civil Government and Military personnel, Ambassadors/High Commission Defence Attaches and CEOs of public and private sector Defence Industries.
- b. **Invitation to Foreign Delegations IDEAS-2010:** Total of 287 delegations from 101 countries were invited for IDEAS-2010 by the following:-
- Minister of Defence Production.
 - Chairman Joint Chiefs of Staff Committee.
 - Chief of Army Staff.
 - Chief of Naval Staff.
 - Chief of Air Staff.
 - Secretary Defence Production

Briefing – Designate Defence / Service Attachés: About eleven (11)

Pakistani designated Defence / Service Attachés were given presentation / briefing about DEPO during the financial year 2010-2011.

Foreign Exhibitions attended in 2010-2011: Following Foreign Exhibitions were attended in 2010-2011:-

- | | | |
|--------------|----------------|-----------------------------------|
| a. IDEX-2011 | Abu Dhabi UAE | Pakistan Pavilion was established |
| b. IDEF-2011 | Ankara, Turkey | Pakistan Pavilion was established |

Foreign Exhibitions Expected attendance in 2011-2012: Following Foreign

Exhibitions are expected to be attended in 2011-2012:-

- a. 3rd "BRIDEX-2011", Brunei Darasalam
- b. Dsei-2011 London UK.
- c. Dubai Air Show, Dubai
- d. Langkawi International Maritime & Aerospace Exhibition (LIMA)
Langkawi (Malaysia)
- e. Defence & Security Exhibition, Thailand
- f. DIMDEX, Doha (Qatar)
- g. SOFEX, Amman (Jordan)
- h. DSA, (Kuala Lumpar), Malaysia
- i. Kazakhstan Defence Expo Middle East
- j. Africa Aerospace & Defence Exhibition, Cape Town, South Africa

Conclusion: DEPO is committed for successful conduct of IDEAS-2012 and help in promoting the products of defence industries of Pakistan through participation in foreign exhibitions and conducting visits of foreign delegations to DEPO and addressing to all Defence equipment related inquires forwarded to DEPO by DA(P)s or foreign DAs at Islamabad.