



His Majesty King Abdullah bin Al-Hussein





HRH Crown Prince Al-Hussein bin Abdullah



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**Aqaba Railway Corporation**

# Annual Report 2010

Jordan/Ma'an

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To all employees in the railway sector.....

To all people exerting their top effort for the sake of their homeland's progress and prosperity.....

To all people who believe in their work.....

To each colleague who seriously and continually works in our beloved national organization day and night, exerting his or her best effort for the constant development of our beloved Jordan ...

ARC performs the effective rule in phosphate transportation by offering a competitive price , which ,in turn, makes Jordanian phosphate prices competitive compared with international prices .

ARC ,As well, participates in developing the southern district of the kingdom.

The railway sector has consistently proven its importance in turning the wheel of economy in addition to providing important support to all modes of transport due to its positive impact on environmental conservation and reducing the number of road accidents.

For that reason the government of Jordan has entrusted the Ministry of Transport to develop Jordan's railway infrastructure by preparing a railway master plan along with necessary studies .

As the Aqaba port is being shifted tend the railway line will no more reach the new port.

ARC insist the Shydia link should be built so that ARC will continue to transport phosphate from the mines until unloading facility proposal to be built somewhere near Aqaba .

We therefore endeavor to work and implement the railway master plan, realizing His Majesty King Abdullah the Second's vision.

I have the honor to extend my great thanks to his Excellency, Minister of Transport Eng Mohanad Al-Qudah, and all ARC Member board, and all ARC employees, and to everyone taking part in producing this annual reports. I wish that Allah may make us successful, and may Allah save the leader of the nation, His Majesty King Abdullah the Second.



**Eng.Hussein Krishan**  
**Director General**

## Basic information

- Track Gauge : 1050 mm
- Total Length : 293.341 km
- Number of Tunnels \ (2) \ = 116 km
- Number of Bridges \ (1044) \ = 4422m .
- Max Gradient \ (2.692%) between Yutum and Emran Station
- Min Radius : 125 M
- Number of Diversions : 105
- Max Sea Level Station : Aqaba – Hedjaz Station (1141)M
- Total number of locomotives in service = (23) as follow :

Model	Quantity
U17	4
U18	3
U20	12
C24	4

### Total Number of Wagons as follow :

- Wagons in Service (212) .
- Wagons Under Repair (7).
- Common Service Wagons (61).

## Introduction and establishment

Jordan Railways history started from the beginning of last century , work started in building track link between the Northern and Southern parts of Jordan in 1900 ,The part of track is considered part of the main track which links Turkish land with AL-Median passing through the capital city of Amman , which is called Hedjaz-Railway .

This track was linked by a sub-line to Ra's -EL-Naqab in 1942 to carry phosphate from mines to Ras – EL-Naqab station then by trucks to Aqaba Port .

Due to the importance of phosphate to the Jordan National income , it has become very necessary to find an economic and high capacity ,means of transport .

For this reason concerned government officials had taken the decision to

construct a railway line to connect phosphate mines with Aqaba port .

Work had started to strengthen the part of Hedjaz Railway from AL-Hasa mines to Batn-EL-Ghoul .

A new line was constructed to connect Batn EL-Ghoul to Aqaba port in Nov 1972 and officially opened in 14/11/1975. a new organization called Aqaba Railways Corporation(ARC) has been named to manage this railway , a new line was added to join phosphate mines in AL-Abiad 22 KM long , the total length of track reached 293.34 Kms .

It has been founded according to law no (22) in 1972 ,and has been granted an independent character both financially and administratively so it can practice its authority and power to construct, manage operate and maintain Railway track for the purpose of carrying both people and cargo . Board of Directors headed by minister of transport supervised ARC management which is headed by Director General according to special financial and Administrative instructions and regulations.

## Legal status of ARC

In 1972 , Act No(22). declares the establishment of Aqaba Railway Corporation as a financially and administratively independent entity

ARC was given the legal authority and responsibility to construct operate and maintain a railway system for passengers and goods transport purposes .

## Managements of ARC

- The board of directors (BOD) is the highest body of ARC's management system.
- It Is chaired by the minister of transport and consists of seven members. Five are governmental officials and two represent the private sector .
- BOD is formed by the cabinet decree upon the recommendations of the chairman .
- Director general (DG) is appointed by the cabinet .
- Director of operational and administrative depts. are appointed by the chairman of BOD .



## Vision And Mission

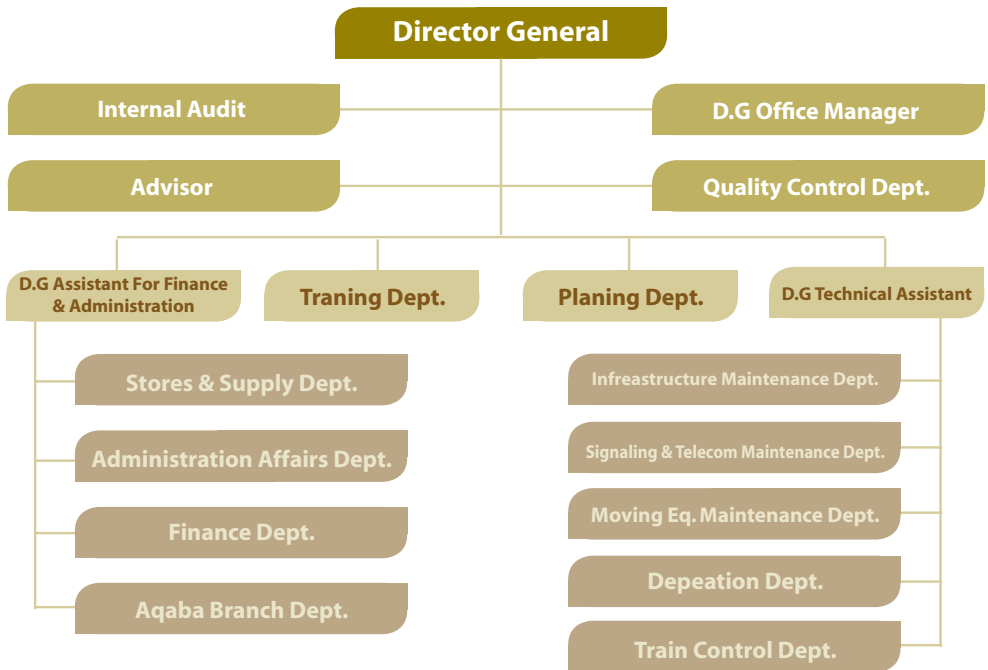
### The vision :

Safe and competitive local and regional transportation .

### The mission :

To achieve for ARC a significant level in transportation and meeting the clients demands , with best efficiency keeping staff motivated and environment aware .

## Organization Chart



## Infraestructure :

### Permanent way :

- The length of the track is 293.7 Km of gauge 1050 mm(Narrow gauge).
- ARC has rehabilitated the track which belongs to Jordan Hedjaz- Railway (JHR) ,from Alhasa station to Batn-Elghol station of a total length of 168.9Km.
- ARC established the track from Batn- Elghol station to Aqaba port station with the same gauge 1050 mm.

- In 1990 ARC has relayed the track from Batn-Elghol to Aqaba port using (S-49) rail and concrete sleepers.
- ARC has special machines like(Ballast cleaner, Tamping machine flash butt welding machine....etc)
- There are 18 stations from Al-abiad to Aqaba Port running and crossing trains .
- The length of the loop in each station is 450 meters (App).
- To run the train safely , all stations are provided by signaling and telecommunication and control panel systems.
- Using (UHF) system at the all stations .

### Locomotives

The table below shows the number ,types ,and specifications of the locomotive fleet used in ARC.

All are diesel electric, made by General Electric (GE) /USA

Type	Wt.	Qty	Year
U17	94.3	4	1974
U18	94.3	3	1977
U20	94.3	12	1980
C24	103	4	2007

### Wagons

ARC uses hopper type wagons with self-steering cross braced bogies. Number and Technical specifications of the wagons fleet tabled below

Make	Mass (Tone empty)	Payload (Tons)	Year
Bre-Metro	21	42	1974
Gregg	20	42	1979
Samsung	18	42	1986



## Investment projects and achievements

- ARC has carried during the year 2010 the quantity of 2,126,502 tons of phosphate which represents %104.2 of plan i.e (2.04) milion tons of phosphate. ARC revenue reached up to JD 13,511,123 This great jump in phosphate Transport is due to distinct Administration thinking and employees great effort to achieve this figure , therefore ARC board has considerably rewarded employees for their Self – denial and big effort exerted during the year .
- ARC trains had carried the above mentioned quantity from Abiad , Hasa & Shidya mines at the range of five trains daily especially shidya mines which took the greatest portion of transport operation.



- Locomotive No 701 which had an accident has modern technology and computer control, was put into service in the year 2007. locomotive repair took place in ARC work shop without reference to manufacturer or any other foreign experts.

Locomotive repair took place through complete program to repair mechanical & electrical parts & setting up loco's computer according to international operational data.

Repair cost of Loco No 701 reached up to JD 130.597 In comparison. with its cost at the manufacturer workshop which is estimated to reach up to JD 1,027,201 .As follows:

- Repair cost JD 476.410 , Shipping cost JD 550.800

However, the directions of director general has the great effect to achieve this job done successfully.

The following pictures shows the stages of Loco repair



Picture of the damage



Accident in 27/7/2010



Picture of the maintenance process



Picture of the maintenance process



Picture of the locomotive after maintenance

- One of ARC goals is to achieve transport plan as agreed with upon JPMC in less time and cost . therefore, ARC had upgraded infrastructure of rail- way track ( 17 ) kms of track in southern area had been cleaned up from sand, 3500 sleepers and 700 rails had been replaced beside upgrad- ing the availability of stock through implementing periodic repair and maintaining 58 wagons , in addition to implementing different periodic maintenance of 138 locos.





- GPS system had been implemented to follow up the process of complete controlling trains & vehicles , All trains & vehicles have been followed up daily by Administration through this special system.
- His Excellency , director general headed the 36th meeting of Arab railway union board . concerned subjects of Union & proposed program for the next years had been discussed ,government of Jordan represented by director general of ARC had been rewarded and thanks granted to director general for heading the Union and for his achievements through the past two years . Syria will head the Union during the next two years.





- Under the care of his Excellency, minister of transport with the cooperation with UIC, ARC had held the symposium of mediterranean railway infrastructure maintenance. Representatives from Arab world and other friend states had participated in the symposium. several lectures were given under the subjects of Assets Management. in addition to maintenance of track, bridges and machinery used in maintenance and welding process, beside troubleshooting track problems.

It's important to say that ARC is one of the effective members of UIC, UIC includes 200 members from all over the world who are concerned with railway transport. from this body, there is an executive board includes 22 members it's head office is located in USA.



- Within ARC strategy to promote manpower efficiency several training courses have been arranged in the training center after spotting current and future training needs including three main areas:
- Administration training.
- Technichal training .
- Information technology training.



- Local social development is one of ARC's concerns therefore, some training courses have been arranged for man power in different government departments in southern region.





### Main training course :

- ICDL Course
- English Language Course
- IT
- Computer Typing
- Mechanic and electric courses
- Wagons new employees basic courses
- Specialized signaling course
- Wagons inspectors
- Train drivers course
- Train drivers Air system course
- Rail engineering students training
- Train panel operators course

### Training courses as follow :

Course	Number	Participation
Local administrative	26	205
Visits & forms	34	923
Technical	40	233
Total	100	1361



## Main achievements of ARC directorates

### ARC Board of Directors

- ARC Board held (4) meetings through the year 2010 , in which necessary actions had been taken to run the work Some decisions taken are:
- Approval to ARC tender committee decisions to purchase all required spare parts for both locos and wagons .
- Approval to ARC budget and final audit
- All necessary actions to run the work and get rid for all troubles so as to promote the availability of locos and wagons which had raised the transport plan and as a result increase ARC revenue.



### Control department \ Phosphate Transport

Number of locos & wagon and quantity of phosphate loaded from the three mines :

	Al-Shidya	Al-Abiad	Al-Hasa	Total
Number of trains loaded	1263	226	203	1692
Number of wagon loaded	40698	6266	5605	52569
Quantity of phosphate loaded	1627920	263172	235410	2126502

Planned Phosphate quantities compared with actual quantity loaded by train

	Actual	Plan	Actual%
Number of trains	1692	1620	104%
Quantity/Ton	2126502	2040000	104.2%

## Locos and Wagons Maintenance

### Work performed at Aqaba workshop

#### Periodic and regular preventative maintenance:

For reliable operation of these costly assets with sophisticated equipment, the locomotives have to be given periodic and regular preventive maintenance attention called schedule repair, which are generally specified by manufacturers based on time intervals or KM count. These in the case of the GE locomotive on the Aqaba workshop, are specified as following : Daily , Monthly, Three months, Six months and One year inspection

Maintenance Type	Quantity
Monthly inspection	88
Three months inspection	25
Six months inspection	17
One year inspection	7
Two year inspection	1

During 2010 , Aqaba workshop done of periodic and regular preventive maintenance as in the table

#### Corrective or failures maintenance:

During 2010 , Aqaba workshop done of corrective or failures maintenance for locomotives failures as in table

Failures type	Quantity
Bogie notes	413
Engine	120
Electrical	380
Air & compressor	71
Wheel slip & Power Ground	234



## Rates of achievement of the objectives set for the year 2010, according to the maintenance plan and constraints

What follows, as shown in the table the percentage of completion of the objectives set for the year 2010, according to the maintenance plan and constraints:

No.	objectives	Percentage of completion	Justification for the delay in completion
1.	Repair of locomotive No. 701 incident	100%	
2.	Tender repair of three traction generators	100%	
3.	Tender repair of 24 traction motors	100%	
4.	Monthly inspection 116 times on locomotives	76%	Delays in the monthly and just six months inspection for the following reasons: 1 - two locomotives out of service because of the incident and are 315 and 305. 2 - Stop the locomotives (963,412,411,&410) for work because of the large-scale failures and maintenance for a long time. 3 - Last emergency breakdowns and the inability to separate trains on schedule due to demand for the service to secure the transport plan. 4 - increase the percentage of completion of the annual disclosure of 100% to 116.65%
5.	Three months inspection 25 times on locomotives	100%	
6.	Six months inspection 21 times on locomotives	81.3%	
7.	One year inspection 6 times on locomotives	116.6%	
8.	Two year inspection 1 time on one locomotive	100%	

## Work performed at Ma'an workshop

Do all the work required for the maintenance of wagons, as followed

Action	Number
Wagons repair in workshop	3110
Wagons repair along with train	333
Wagons routine maintenance	58
Wagons bearing removal	660
Wagons wheel assembly	422
Locos bearing assembly	110
Locos bearing clean	287
Wagons bearing testing & assembly	851
Pressing locos wheels	110
Re-profiling wagons wheels profiles	622
Testing wagons wheels	276
Turning pins and bushes	1282
Locos wheel lathing	4



## Permanent way

- cleaning up 17 kms of southern area line between diesi & Umran station.
- Inspecting bridges & culvors all through the line and it's sublines in stations.
- Cleaning up loading lines in Hidjaz station and cleaning up points in Hasa and Abiad mines.
- Inspecting track tunnels ,curves ... etc. by railway technicians .
- Foot ,Train and Machinery inspections had been done as follows:

Action	Total quantity
Rail changing	700
Sleepers changing	3500
Insulated joints changing	48
Ordinary joints changing	1772
Points welding	55
Wagon ballast unloading	106
Thermit welding	304

## Planning directorate

- Studying and floating the tender of GPS for follwing up the movement of vehicle and trains in coopreation with concerned departments. Several engineers had been trained at the suppliers .
- Work of electronic archieve is going on in cooperation with Al-Hussein Bin Tala University. university is expected to have it complete in the first quarter of the year 2011.
- following up ARC computer maintenace in addition to regular local net maintenace .
- Preparing & following up plans within Ministry of Transport plan for executive develoing program.

- Preparing transport agreement between ARC & JPMC in cooperation with concerned departments.
- Constant cooperation with directorate of training to get employees trained in the field of IT. Several courses had been held in ARC Training Center especially in IT subjects held by the training engineers.



## Signaling & Telecom .

### Telecom:

- Repair of earth cable failures between port & Aqaba station. quantity/4
- Repair of motorella mobile radios quantity 15
- Repair of walky talky radio . GP300. (Q.25 )
- Repair of locos electrical regulators (Dc.Dc convertor)
- Repair of multiplex cards in stations Q.12
- Repair of charging convertors for small radios Q.12
- Replacing of charging battaries for small radios Q.18
- Replacing of small radios antinas. Q.4
- Replacing of motorolla mobile radios. Q.14
- Repair of all phones, fax lines
- Repair of opeators failures in Aqaba . 3 times
- Annual checking up of all radio systems . 3times



### **Signaling :**

- Disi points No 2 and rum point No 1 Overhauling
- Rebuilding of Disi station line systems which were unsafe for train operation , Self-effort had been exerted to have job done .
- The station is now working without any significant failure .
- Work is going on to rebuild quantity of 3 failure points due to train accident . work will be done in three months.
- Maintenance of 18 stations according to ISO regulations.
- Placing new train inter- key in port station and have some modification of the old key because no replacement was available.

### **Generators:**

- Dailly & periodic maintenance for all stations generators .
- Rebuilding of accident generators .
- Repair of spare generators in Ma'an despite the fact that the generator was too old.

## Finance directorate \ ARC financial situation

- ARC total revenue reached up to ( 13,511,123 )JD
- ARC total Current expenses reached up to (9,697,208) JD
- ARC total capital expenses reached up to (2,427,168) JD
- Total expenses self-financing (capital & current) reached up (12,174,376) JD .
- Total financial earnings in the year 2010 Reached up to(1,336,747) JD
- The sum of(1,000,000) JD had been submitted to ministry of Finance according to ARC letter 16/23 dated 5/1/2011.
- Remaining earning is used to pay off ARC financial obligations
- Reached up to (336,747) JD
- Net cash in ARC for the year 2010 reached up to (363,747) JD .

## Supplies and tender

### Tender

- 44 tenders through the year .
- Following up 2009 tenders .

### Purchasing

- Outside purchase :  
Directorate of supplies and tenders performed (42) Foreign purchases with total cost (764.684) JD
- Local purchase : total cost of (132.640) JD

### Stores and supply control

Performing the yearly warehouse inventory check up matching records between finance and store .

### fuel

subject	IN	OUT
Diesel oil	6789162	6740054
gasoline	32492	32085
oils	114598	120644

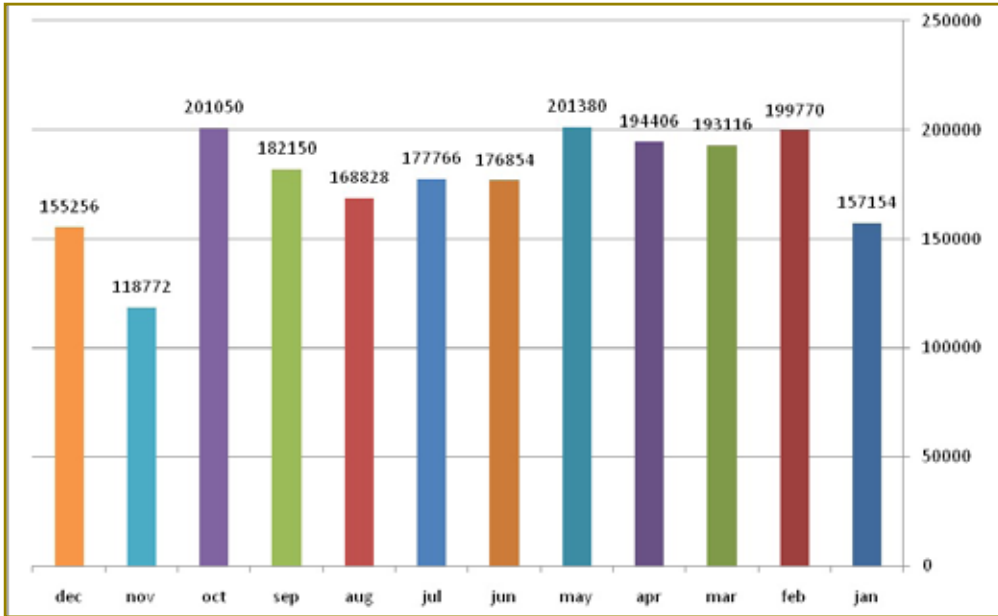




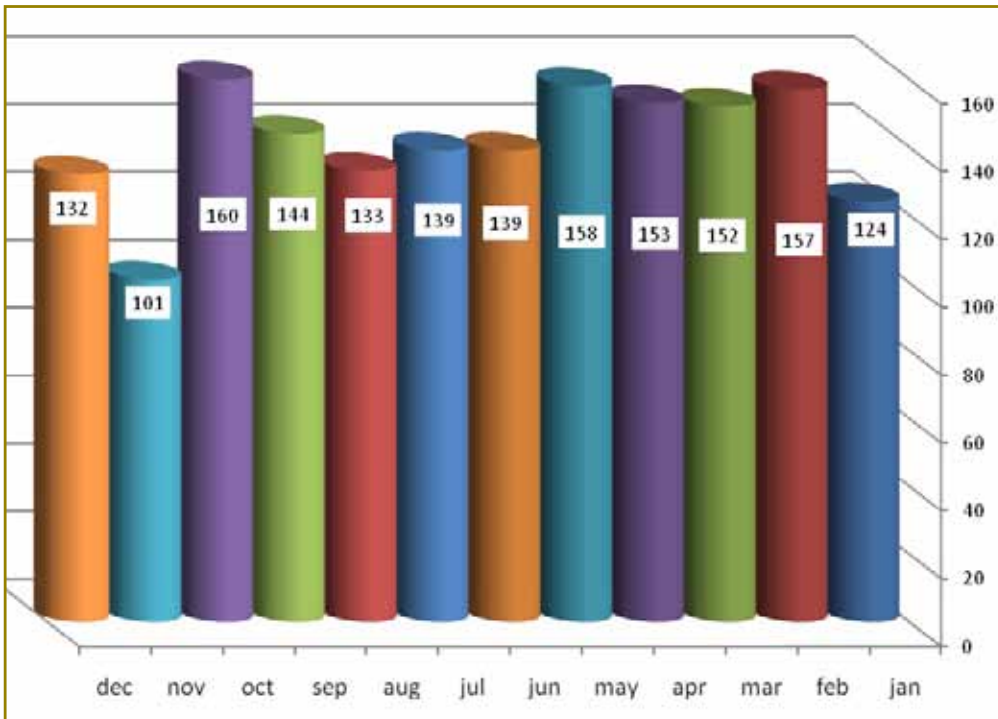
# Charts And Graphs





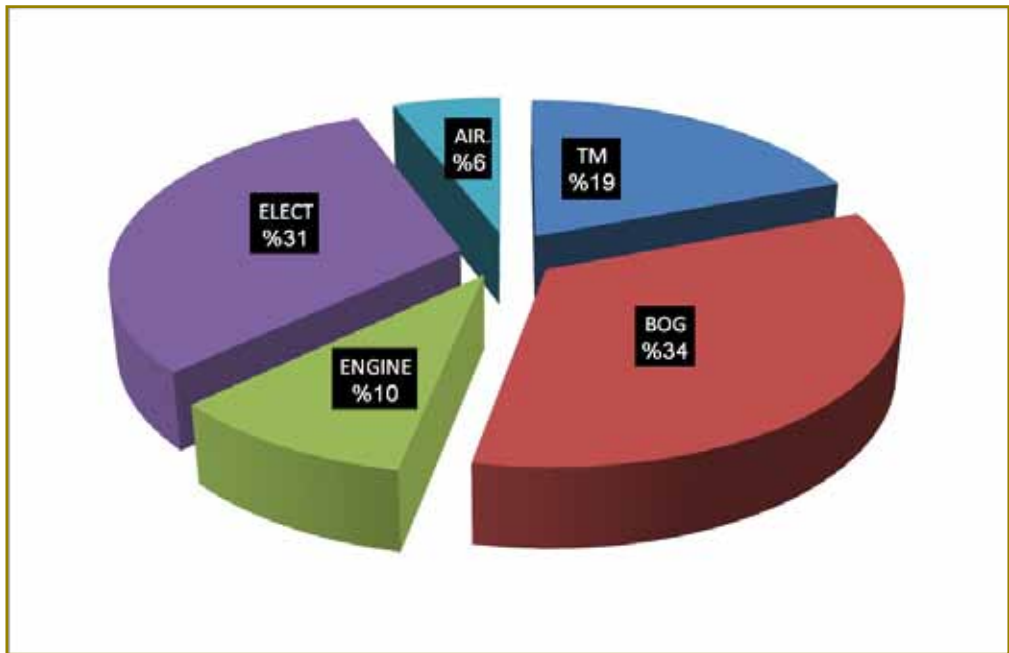


Quantity of phosphate carried by trains during 2010

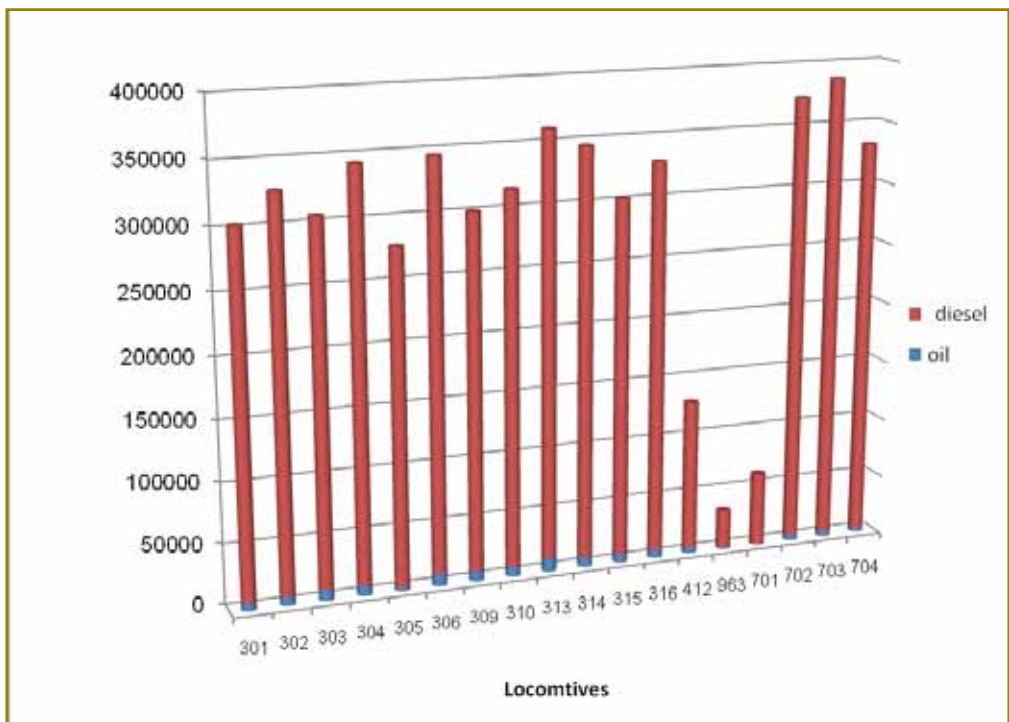


Number of trains loaded during 2010

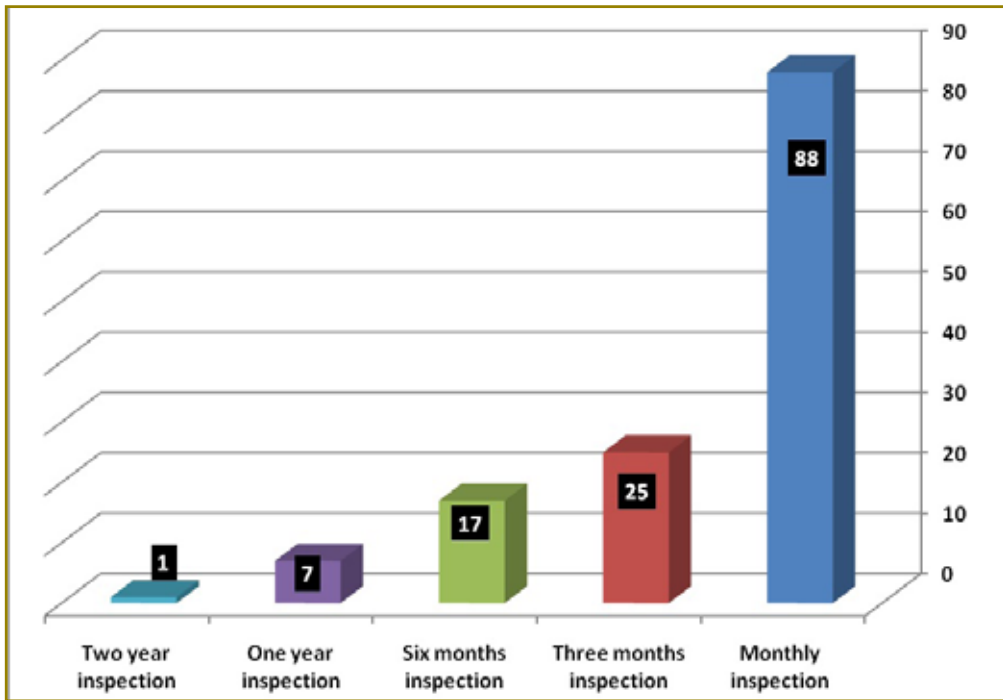




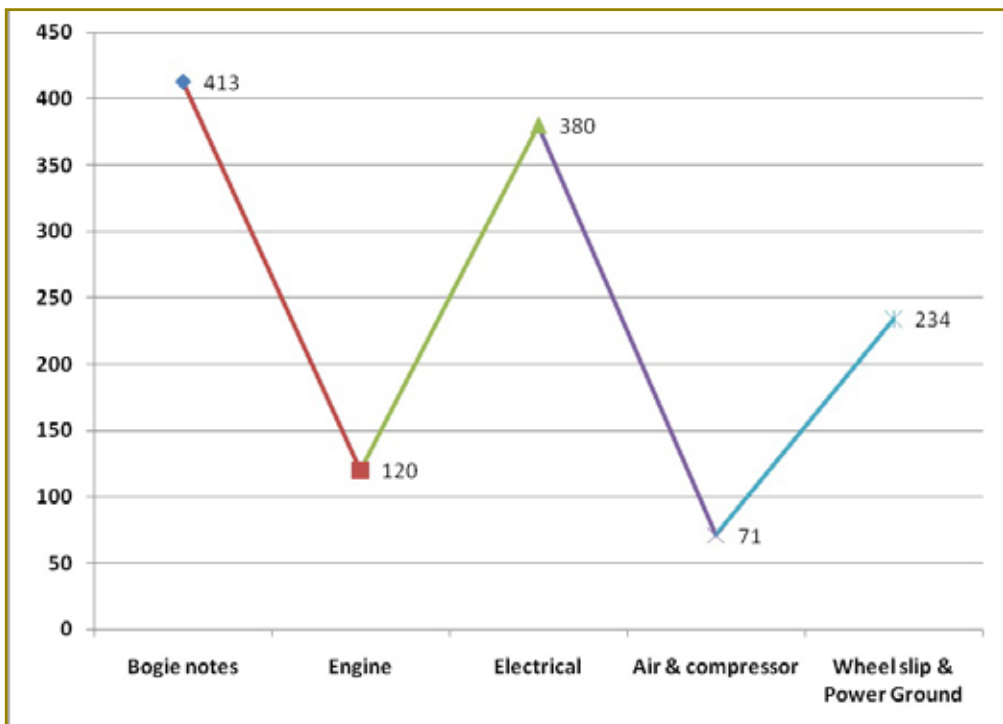
Locomotives failures during 2010



Diesel & oil consumption during 2010

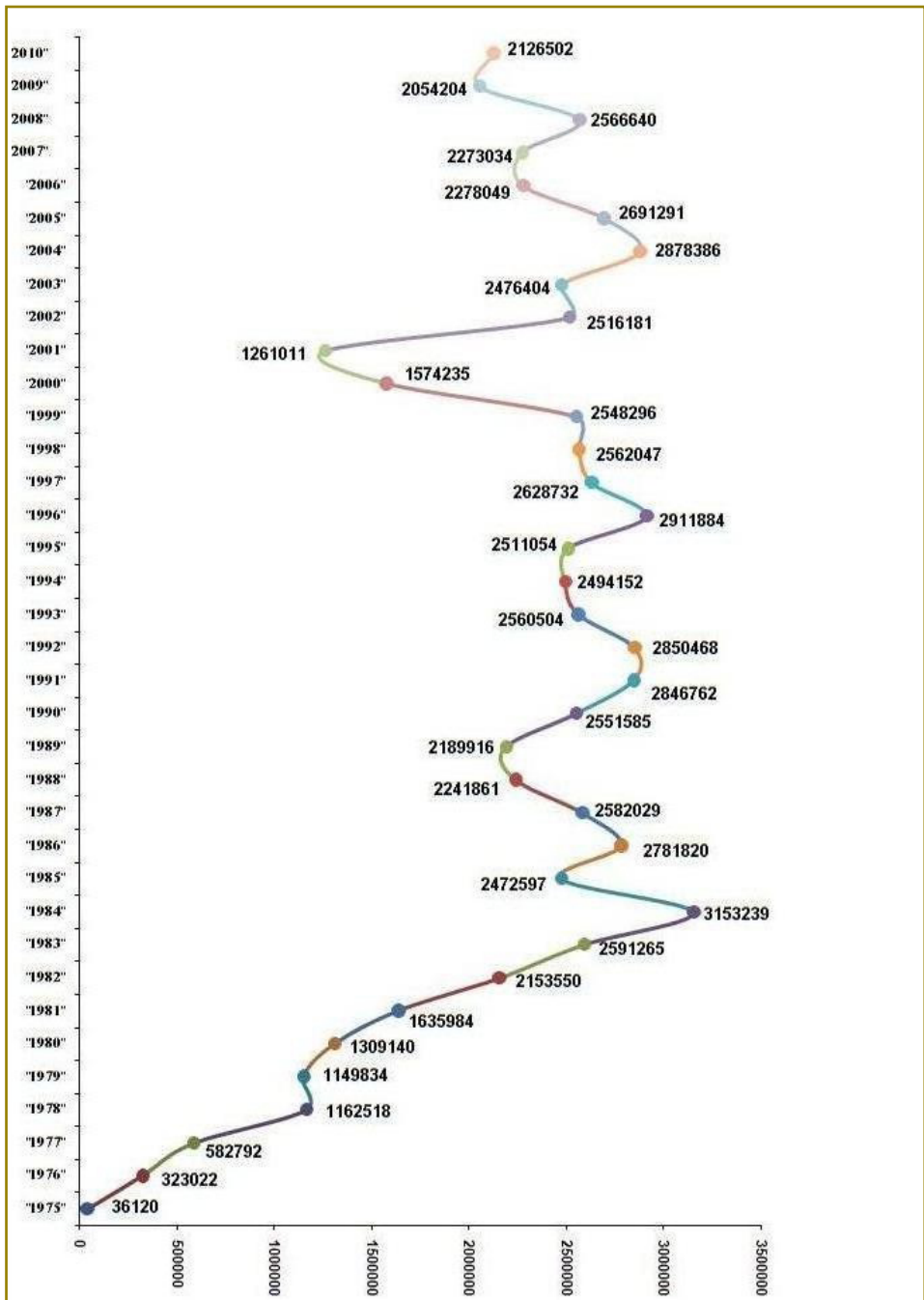


Periodic and regular preventive maintenance during 2010



Corrective or failures maintenance during 2010





Quantity of phosphate carried by trains between 1975 - 2010