Democratic Republic of the Congo Fuels Survey

A survey of the humanitarian fuels situation in the Democratic Republic of the Congo

The report relates to conditions that existed at the time. The study was conducted from 9 July to 20 July 2006. This report would not have been possible without the help and invaluable assistance that was freely given to the UNJLC.

The author and the UNJLC-Kinshasa team extend their deepest appreciation to the Government of the Democratic Republic of the Congo (DRC), the UN agencies, MONUC staff, non-governmental organisations (NGO), governmental organisations (GO), and other aid agencies. Also, thanks are given to the DRC oil industry including FINA, SHELL, TOTAL, ELF, CONGO-OIL, COBIL, COHYDRO and SEP. Each organisation freely gave information and advice to the extent that they were able, and provided an invaluable insight into the storage, distribution, and oil market. Without this assistance, this report would have been exceedingly difficult, or indeed impossible, to compile in such a short time frame.
EXECUTIVE SUMMARY

The DRC is about to enter into a difficult phase of its evolution and it is envisaged that some form of United Nations presence will be required for many years to come. Therefore the thrust of this report is to outline the current storage and distribution systems as they stand, and look to the future from a humanitarian viewpoint in the short and medium term.

Due to the short period of the study and the vastness of the country, the author was required to use previous experience of country, as well as knowledge of the fuel industry, in order to complete the report. Together, these provided the technical input and, in many cases, the experience the UN agencies required when addressing the logistical problems encountered. It cannot be emphasised enough how valuable the free flow of information from all parties was in the compiling of this report.

The main issue with the fuel distribution to the humanitarian community in the DRC is the lack of common services between agencies and the largest UN fuel consumer, MONUC. Barriers to success could become evident if UN agencies do not cooperate in their ability to meet the MONUC fuel needs in a manner that minimises the administrative tasks. It is firmly believed, provided that no such artificial obstacles or lack of flexibility are demonstrated, that an integrated fuel contract will come into existence in the DRC, representing a tremendous success and triumph for the United Nations family. In addition, the contract will decrease agencies’ spending, building in greater flexibility and allowing each agency to concentrate on their respective core business. This contract may well prove a catalyst and assist in pointing the way to future contracting inside the UN family. As such, merit should be given to the hard work that had already taken place on the subject of integrated contracting, and the tremendous goodwill from all involved to make fuel a common service.

The Services des Entreprises Petrolières (SEP) system, the backbone of the supply and distribution of fuels in the DRC, is workable but lacks flexibility. With the existing extremely long supply lines, there is undoubtedly a need for a greater understanding by the operational and ground planners. These individuals must realize the importance of initially establishing what the capability of each depot is, and compare this against the monthly requirement and replacement re-supply cycle. Any fuel dispensing outside of that cycle needs careful analysis, and perhaps a system of central control to ensure that the normal supply pattern is not disrupted. It was noted on several occasions that, had a control system been in place, it would have stopped shortages that were eventually filled by flying in fuel to replenish a base. The use of centrally controlled strategic stock levels in key areas could address the overall planning needed between operational staff and the supply chain managers to minimise the potential shortages.

Due to the short time scale of the visit, a full examination of a fuel support plan to assist in an evacuation of UN staff was not examined. However, it was noted that no fuels in the SEP system were earmarked for any contingency planning. Experience in other missions suggests that perhaps this should be looked into and if necessary formalised.

The fuels infrastructure in DRC is in dire need of a cash injection, as it is in generally poor condition, and is being run on very low financial resources. If the election results return undecided, outside investments will stall. If the elections produce a positive result, one can expect to see oil exploration start in all three areas outlined in this report. This will trigger the much needed investment in the supply chain. However, although the indicators are excellent for oil and gas production, assuming a stable environment, it will take approximately 5 years before fuels investment has an impact on the DRC. If there is not a stable government capable of carrying out legal and binding contracts, there will be limited exploration and all planning will be suspended.
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SCOPE AND OBJECTIVES

The scope of this survey is to review and clearly document for the humanitarian community, the existing and required fuel logistics supply chain, and probable developments in the foreseeable future. This report will provide agencies with a clear understanding of the fuels logistics challenges affecting their operations, particularly in light of developments subsequent to the results of the 30 July 2006 elections.

The survey was limited to DRC and neighbouring countries from which fuel may be supplied over land, particularly Kenya, Burundi, Rwanda and Uganda.

The objectives of this survey are to:

- Identify how the humanitarian community may be more effectively served by fuel logistics, including: improving access to and the effectiveness of commercial arrangements, enhancing the logistics planning process of the respective agencies and organisations, and further assisting them to optimise their logistic support;

- Identify practical recommendations for eliminating or ameliorating capacity limitations and bottlenecks;

- Provide practical recommendations for how a strengthened fuels logistic co-ordination structure may be developed within the humanitarian and peacekeeping community, including optimising the use of facilities and combining purchasing power;

- Identify for the United Nations and the relevant civil authorities of the Government of the DRC, infrastructure development that could alleviate bottlenecks and contribute to the economy of the country and the well-being of its people.

The survey was conducted over the 9 July until 20 July 2006 period by the UNJLC Fuels team. In Kinshasa, visits were made to the Ministry of Energy and Finance, members of the local fuels industry including Total, Fina, Shell, and the state owned companies SEP and Cohydro. Field visits outside Kinshasa were limited due to the limited time frame, however a two working day visit was made to Kisingani. The advice, local knowledge and contributions of UNJLC logistics officers, other agencies, and MONUC staff proved invaluable.

Assumptions and Methodology

Assumptions used in this report are that:

- Fuel dependencies (i.e. - requirements) for UN agencies are generally those as contained in the UNICEF-generated fuel usage document illustrating the demand requirements of the humanitarian community and shown in the Fuel Process section;

- The humanitarian community’s operations in the DRC will continue for at least another year and most likely, several more years;

- The UN MONUC peacekeeping operation in DRC will continue for at least two more years;

- DRC domestic ground fuels consumption, excluding demand created by the UN presence, will grow by at least 3% in 2006-2007;

- DRC domestic aviation fuels consumption will grow by about 3% in 2006-2007;

- The reader has a reasonable working knowledge of the DRC geography, its people and the climatic patterns, with regard to the rainy season and its effect on logistics in the various regions.
The methodology utilised by the team is as below:

Firstly, the sources of the fuels used in DRC were examined, being mainly product imports by sea on the West Coast, overland from the South, and through the Port of Mombassa from East Africa. This allowed a better understanding of the key factors driving costs, and in turn, shaped the assessment of how planned and actual developments might impact the UN mission. Much of this information is in the sources of fuel section. The oil industry in DRC is emerging slowly, and one would expect to see this growth continue at a steady rate as exploration continues. Therefore, the information on discussed locations is important to afford the reader a better understanding of the supply of fuels in the future, which may be effected by the possible development of that resource.

The next phase was to review the process by which those sources become usable fuels. This was relatively simple, as it involved mainly coastal supply and overland routes arriving from neighbouring countries. There are no functioning refineries in the DRC. This allowed the author to examine the balance between requirements and outputs both today and in the future, and study how the UN family fits into this equation.

Figure 1 - Illustration of Methodology Used in Fuels Survey

Next, the area of greatest practical interest to the UN was considered: supply and distribution of fuels and impact on costs. This involves the traditional and well-tested river/rail and road supply chain. It is believed that as the peace develops, one will see new routes open in each region. In anticipation of this, this report analyzes the key bottlenecks and potential solutions to address them.

Finally, the author reviewed the potential implications for the humanitarian community, with regards to the special case of integrated fuel contracting. This has become known within the humanitarian
community as the **Unified Fuel Contract**. If properly managed, this contract represents a key opportunity for the UN family to work together in mutually beneficial common service, while ensuring the most effective and economical utilisation of donor and member-state funding. The wisdom gained from a more unified and co-operative approach will be particularly evident.

Due to time constraints, ways of reducing the UN demand through greater fuel efficiency were not investigated, though this is a factor which each agency should be aware of as there are many inefficiencies and possible solutions in this area.
SERVICES DES ENTREPRISES PETROLIERES CONGOLAISES (SEP)

Services des Entreprises Pétrolières Congolaises (SEP) is the main fuel logistics operator in the DRC. As such, it is important to first understand SEP in order to understand the DRC fuels supply chain.

SEP is a semi-public company subjugated to private law. Its shareholders are:

- COHYDRO (public company) 36.6%
- ARISTEA Group (TOTAL/ENGEND) 36.6%
- SHELL Overseas holding 13%
- COBIL (previously Mobil; public company) 7.8%
- SCP-ELF 6%

(The illustration opposite outlines the current state of shareholding but this can, and is expected to, change as new investors are attracted into the DRC and other more established operators pull back to their core business in the Up Stream Market. SEP is a purely service based organisation and will serve all shareholders on a pro-rate basis.)

SEP Mission

Receipt, storage, handling, transport and quality control of refined oil products from the entry point in the country to the delivery/consumption point. As a consequence, the company is in charge of countrywide maintenance, security and development of fuels infrastructure and equipment in compliance with technical and security standards. SEP-CONGO is also the exclusive customs agent for the customs clearance of oil products.

SEP Logistical Capability

SEP-CONGO operates with 1,500 staff members in the following locations:

- 38 depots and bases owned or rented by SEP-CONGO all over the country. The overall storage capacity is 232,275 m³ (25 inland depots, 10 depots at airports and 3 pumping stations)
- A pipeline network with a length of 719 Km and a pumping capacity of 800,000 m³ per year. The pipeline transports the following liquid refined hydrocarbons: Petrol, Jet A1 and diesel. The network of pipelines consists of:
  - 2 pipes of 6” diameter on the Matadi-Kinshasa axis (666 Km)
  - 1 pipe of 6” diameter on the Massina-HRS N’djili axis (11 Km)
  - 2 pipes of 6” and one of 10” on the Massina-Kinshasa axis (42Km).
- A fleet (5 pushers/barges), a rolling stock (115 units comprising 113 rail fuel cars and 2 locomotives), road transport (35 trailers, 32 prime mover tractors, 31 semi-trailers, 22 fuel road tankers and 5 fuel trailers). The general condition of the listed equipment may be assessed as “functional but not good,” mainly due to the factional fighting and internal conflicts over the past years.
SEP product growth reached around 900,000 m³/year in the 1990s, but SEP-CONGO activity has now fallen to 420,000 m³/year (all products included). The current operational storage capacity is approximately 155,000 m³, which accounts for roughly 2/3 of the total storage capacity. The reasons for this low amount are as follows:

- General deterioration of the economy, particularly in the manufacturing and transport sector. As a consequence, the main activity is now concentrated in Kinshasa.
- Due to fighting, areas that were previously commercial no longer are, except in those areas where MONUC is present.
- Emergence of large smuggling operations capitalizing on the illegal importation of fuels in the South (e.g. - Lubumbashi, Kananga)

A major remit of SEP is to set the official pricing structure of hydrocarbons. Theoretical remuneration is currently 2.7 million USD/month, which barely covers operational costs. There was no evidence of profitability, which is needed if investment programs are to be initiated. Although the official pricing structure is technically in place, little if any attention is taken of it, with market forces being the actual price determinant. Local government taxing and transportation cost are almost always included in the price.

Most of the depots’ spending costs are fixed annually. The priced charged by SEP is also fixed and does not take into account the length of the delivery supply chain. An examination of the SEP accounts highlighted the losses in all areas outside of Kinshasa. This is an example of why oil company investment is not currently observed in DRC, thus explaining why in remote areas there is little infrastructure.

The system suffers from some fairly basic and fundamental issues which are:

- Lack of regulation on the storage and transport of hydrocarbons and other dangerous products.
- Attacks on pipelines by criminal elements that entail losses of oil products, fire, risks of pollution and delays in the delivery of fuels caused by the repairing of the pipeline. This has lead to increasing costs for SEP (e.g. - surveillance, repairs, etc).
- The smuggling of oil products accounts for the loss of roughly 15 to 20% of the existing volumes (approximately 34,841 to 46,455 m³) and entails losses for SEP-CONGO and the Congolese state.
- Low level of activity compared to the available capacity, thus leading to higher cost per unit.
- Low level of investments compared to what was planned (< 30%) for lack of resources (i.e. obsolescence of equipments).
- Lack of fire fighting equipments and the need for an upgrade of security standards in some inland depots (15 depots), mainly those located in the former rebel zones of the country.

### SEP Development Plan

SEP has a stated development plan to:

- Streamline the oil products market in the DRC (currently being implemented).
- Revise the technical and security standards (regarding storage, transport, town and city planning) by all those involved in the oil industry.

SEP is a cornerstone of the fuel industry and it needs to move forward with its plans if the country is to acquire the necessary infrastructure to support a manufacturing and transport capability. SEP requires major investment, and the author noted that most personnel inside the industry felt that it required a stable government and security. With the latter in place, investment follow as would future oil production and mine exploration.

### Oil Companies

The major oil companies working in the DRC are:
**Shell:** A solid oil company that has, through a degree of frustration and prudent business management, sold or franchised most of its downstream distribution assets. Shell Aviation still continues to exist and is a bidder in the next MONUC Fuel contract.

**Fina:** A relatively new actor in the DRC. Nevertheless, it is investing and growing, be it at a slow rate. Fina has stated that it will bid for the MONUC contract.

**Total:** A strong company that owns Elf. Once the government settles and the courts function, a number of adjustments to the market will be made. Total Operates in the DRC as part of the Group Aristeia.

**Engen:** A company with its base in South Africa, owned by Petronas of Malaysia. Looking to expand in Africa and is expected to see a more proactive approach after a stable government is formed. Engen operates as part of the Group Aristeia with Total.

**Cohydro:** The National Oil Company. It has a number of assets around the country mainly based where SEP operates. It is a company that urgently requires investment and it would not be a surprise if after the elections, a new government privatises the company so that it can be more competitive.

**Congo Oil:** A local company mainly found in the Kinshasa area.

**Cobil:** The remnants of the Mobil Group now Exxonmobile. Operates where SEP have storage.
SOURCES OF FUELS

Overview
The sources of fuel arrive via importation from the following corridors (see illustration below):

- West
- South
- East

Figure 2 - Illustration of Importation Corridors

Western Corridor: Carries approximately 85% of domestic fuels and is fed by tankers arriving in the Ports of Banana and Matadi in the Bas Congo Province. The unloading is at the Matadi and Ango-Ango terminal where 160ft tankers can be accepted. The corridor is linked to the commercial areas around Kinshasa by pipelines, and the central and outer regions by a comprehensive river network supplemented by a patchy rail and road network.

Southern Corridor: Fed from Tanzania by road and South Africa by fuel rail wagons at Kasumbalesa. This route is plagued with problems such as insufficient funding for such basic commodities as diesel to run the locomotives. One situation was observed in which a 9 day delay occurred due to a lack of funding for fuel to dispatch the engine which was to collect the loaded and waiting fuel rail wagons. Obvious cases of smuggled fuels were also noticed, with these fuels being openly marketed in fuel stations under the official rates.

Eastern Corridor: Fed from Kenya/Uganda in the North and Tanzania in the South. This corridor has for some time been affected by the Kenya Pipeline Corporation (KPC) and its problems of under-capacity. Healthy progress by the Kenyan authorities was observed, with the supply bottleneck at Eldoret and Kisumu easing as a result. The following measures have been implemented or planned to take effect in the near future:

- The KPC is increasing the pump capacity, with an additional 3 pumps, thus increasing the rate to 880 cubic metres per hour. The current throughput from Kenya/Uganda is 450 cubic meters
per hour. The monthly exports from Kenya/Uganda to the DRC are approximately 950 cubic metres of Jet A1 and 750 cubic metres of diesel.

- Additional export points have been opened at Nakuru and Nairobi thereby reducing the export congestion at Eldoret and Kisumu.
- The western local traders are being instructed to pick up at Nakuru and Nairobi, thereby taking some load off Kisumu and Eldoret.
- It is planned to open the export terminal at Eldoret and Kisumu on weekends, thus allowing export 7 days a week. This will be the most significant boost to output.

**Corridor Issues:** The work on the pipeline extension to Kampala has been re-evaluated, but due to the planned exporting from South Sudan, the likelihood of completion is low. Additionally, the Tanzanian corridor suffers from extended supply lines, poor transport and poor roads. Nevertheless, it still functions.

The eastern border area has major smuggling issues and a high percentage of fuel enters without being taxed. This then creates a lower price on the market than official state nominated pricing, and prevents the government from gathering revenue from these fuels.

The DRC imports around 450,000 cubic metres annually, excluding MONUC, which is extremely low considering the size of the country and large population. The onset of peace and stability has seen this figure rise, and the government ministries expect this trend to continue to rise to around 1,500,000 metric tonnes within the next 5 years. This is not an unrealistic estimate if peace continues.

**Exploration and Production**

The proven reserves for the DRC are large, and one should expect to see oil production continue with a healthy balance for a number of years.

Specifically, the DRC has the potential to form a solid oil based economy, as the country contains potentially huge deposits of hydrocarbon and gases in a series of sedimentary basins. These fields are located both off-shore and on-shore. The off-shore is currently being developed, with the on-shore largely untouched to date.

The coastal basin produces approximately 27,000 barrels per day. The off-shore component of this is from concessions let to PERENCO (France), TEIKOKU (Japan), and CHEVRON TEXACO (US), with an estimated production of 17,000 barrels per day. The onshore coastal basin production is around 9,500 barrels per day, operated under a joint venture between PERENCO (France) and COHYDRO (DRC). Six new blocks have been created and licenses have been granted for exploration to SURESTREAM, ENERGULF (US/Canada) and SOCO (UK).

In the Central Basin areas around Busira, Lokoro, Bandundu province, Equateur, Orientale, Kasai, Kinshasa and the Eastern Bas Congo province there is evidence of substantial oil deposits.

A further area of some 15,000 km is in the form of oil sand which requires the price of fuel to remain above $50 USD per barrel, if extraction is to be profitable, and requires a highly developed support infrastructure to reach that potential. The shale oil content has been estimated to produce 140 litres per ton.

The final area that is being considered for exploration is in the lakes region, where on the Uganda side, successful light products have been found. There is a large energy source at Lake Kivu where roughly 60 billion Nm³ of known methane gas reserves exist.
**Pipelines**
There is an extensive network of pipelines which are an integral part of the DRC supply chain. These pipelines are efficient, but require investment and security. In terms of investment, the pipelines require funding if they are to continue to play a major role in the current system, and this funding should focus on maintenance and repair.

With regards to security, it would appear that the pipeline is subjected to an increasing number of attacks by criminal elements who profiteer from the reselling of the fuel on the market. This is immensely hazardous and is extremely damaging environmentally, as once fuel gets into the water table, it will remain for a considerable period of time and require costly treatment for removal. The cost of policing the pipelines plus the repair element has placed a large financial strain on SEP.

The main elements of the pipeline network consist of two 6” lines from Matadi (Ango-Ango) to Kinshasa with a nominal transit capacity of 1,400,000 cubic metres per year each. A second set of two pipelines stretches between Masina and Kinshasa with a nominal capacity of 1,980,000 cubic metres per year. There is a third major pipeline connecting Masina depot to Kinshasa Airport (N'djili) of 540,000 cubic metres per year capacity.

**Refineries**
There is a refinery on the coast at SOCIR that has been non-operational for roughly 10 years. One of the issues for the poor performance of the refinery was the heavy nature of the crude collected, which when coupled with the older refining techniques, produced approximately 60% heavy oil that could not be consumed by industry. Although attempts to refurbish the refinery took place in 1998, these efforts were quickly suspended when the cost spiralled, causing the project to be placed on hold.

The government of the DRC has expressed a wish to build a new refinery in partnership with private business with a capacity of roughly 750,000 MT per year. It is believed by the author that this project may require a greater period of national economic growth and fuel market development before this refinery concept becomes a commercial reality. Refineries are costly assets, and many governments import product rather than operate their own.
PROCESS (FUEL SUPPLY)

Overview
The DRC government created COHYDRO, a national petroleum company, to gain some form of control within the country's supply and distribution, but also to be involved in the growing exploration industry and developing oil industry.

COHYDRO (which means La Congolaise des Hydrocarbures) is a public company with technical, commercial and industrial interests. Its primary role can be defined as an institutional body in charge of the implementation of the national petroleum policy of DRC. The main goals are:

- Exploration-Production
- Refining
- Supply
- Transport-Storage (as part of SEPs)
- Distribution

COHYDRO supports the supply and distribution of the following fuels:

**Diesel**
Diesel is the most used fuel in the DRC, and thus the main fuel used to support the supply chain. It is for this reason that larger SEP depots have drum filling capability for diesel. If there is a problem with the diesel re-supply, it is possible for Jet A1 to be used in lieu of diesel when operating vehicles and generators. This is commonly known as the Single Fuel Concept (SPC). If more information is required on this topic, please contact the UNJLC-Kinshasa team who will request the author forward a separate report.

It was noted that a number of UN agencies have imported Chinese gasoline generators. The supply of gasoline is not widespread and indeed, in certain high temperatures environments, can change characteristics to become a Class One (volatile) fuel. The economic argument of using gasoline is understood, but the practical problems of transporting a volatile fuel are huge and therefore gasoline is not always available in a number of areas.

**Jet A1 (Aviation Fuel)**
MONUC is the largest user of Jet A1 in the DRC. Jet A1 is available, but shortages do occur when the extremely long supply chain must cope with unexpected activities, such as unplanned aircraft flights, without notifying fuel supply chain companies (i.e. there are currently no warning mechanisms in place). Additionally, the SEP system allows for the swapping of product between companies.

It was noted that the system lacked an overall control to sound alarms when products were under normal quantities and would thus run short in “X” days (this being the necessary re-supply time). Re-supply is not a simple exercise with, for example, a river route time of approximately 30 days to Kisangani, followed by the settling/re-batching time and test clearance of 5 days which makes this fast response difficult. Hence, it is believed to be important to have some form of monitoring in place.

Additionally, it was noted that MONUC was not receiving the supplies that were requested in Entebbe via the KPC pipeline. After investigation with the KPC, it is suggested that KPC speak strongly with their suppliers.

**LPG**
Used mainly in larger towns but is, in relevant terms, more expensive and will thus remain out of reach for most of the population until such time as the oil industry develops. Once in-country refining has begun, LPG will be a by-product of the refining process and the price will fall dramatically. It was learned that 92% of cooking in the DRC is carried out using wood or charcoal, thus making LPG an
environmentally sound option as well. The cost of the LPG container will, however, remain high and this may be an area that the UN development programmes wish to examine.

**Fuel Standards/Quality Controls**

Fuel standards including detailed specification parameters are enshrined as law in the DRC Status Book. The standards reflect European standards and are, in general, compliant with Joint International Group (JIG) Regulations and American Petroleum Institute (API) standards.

There is no central licensing system for fuels, but insurance qualifications force oil companies to meet the JIG standard to qualify. It is believed, from past experiences in Africa, that this is a weakness. There are many recorded incidents where fatalities occurred because of a lack in capabilities on the part of the contractor or because of a sub-contractor cutting corners. This mainly hinders the aviation sector, and requires the main UN operators of aircraft (MONUC and WFP) to ensure their contractors are capable, have the necessary qualifications and experience, and can underwrite any sub-contractors.

In terms of standards and quality controls, the following areas were inspected:

**Fuel testing and certification:** In general the fuel testing is well run and appears to work well. The procedure covering receipt, issue, and re-batching within SEP depots and other private depots appears to be sound and meets the JIG standard for depot operations. Fuel test and certification is carried out by the main laboratory in Kinshasa. There is a smaller, lower capability testing centre in Goma. This facility was not visited but it was understood from discussions that it performs basic sampling only.

**Calibration:** The Office Congolais de Controle (OCC) is the government department responsible for the calibration of all meters and standards in the DRC. In the SEP depots visited, evidence of this was observed with each meter involved in a cash transaction being fixed with date seals and supporting documentation. However, we understand that this is not a well funded department and therefore care must be exercised when receiving products.

**Drum Filling:** It was noted that most SEP depots had a drum filling capability restricted to diesel only and these drums can be reused.

On the other hand, all aviation drum are filled and certified in Kinshasa. The cost of an empty drum for use with aviation fuels is $65 USD. This is non-refundable, and as the drum plant has no washing and re-spraying capability, the drum can only be used once, thereby wasting the $65 USD each time a drum is required.

An alternative solution to this is the use of rubber drums. This type of drum costs more initially than its metal competitor, but has a large number of advantages. The rubber drum is tough, robust and does not dent. This produces less deposits in the fuel, as is the case with metal drums, thus more fuel per drum can be obtained. When returning the drums, there is also a significant savings because the rubber drum can be “vacuumed” down to a smaller volume, allowing the storage of 10 rubber drums in the same volume as one metal drum. If no vacuum pump is available the ratio is 8 rubber drums to 1 metal drum.

There are two types of rubber drums on the market. One is a basic model that is generally used with a single fuel that cannot be swapped for use with other fuels. It is cheap and an extremely robust model with an average life of 10 years.

The second drum is in service with a number of armed forces. It has a similar construction of a hard rubber exterior, but with an internal, disposable lining that ensures the fuel quality. Once the fuel is emptied from the drum, the lining is disposed off and a new lining used for filling. This allows multi-fuel usage for the same drum. This also assists when flying empty rubber drums of this type, as they are gas free and can be certified as such. The fuel quality is vastly enhanced using the rubber drum with the lining system.
The 200 litre drum with scuff bag (optional) used when working in hazardous environment. The drum is constructed of tough rubber and can be dropped from 90 ft without any detrimental effect to the integrity of the drum or product held in the drum.

The 200 litre drum with fuel lining-type insert has a unique fitting system that has a patent pending. The extraction is normally through a one inch BSP fitting and a hand pump (optional). Although the system delivers clean fuel it is possible that droplets of water can be formed and therefore it is recommended that it be used in conjunction with a filter water separator.

Single Fuel Policy
In certain areas, mainly small bases served by aircraft, it may be prudent to look at a single fuel concept. This can be based on Jet A1 fuel as the common fuel. This is a well tried and tested system used by the US, NATO and other military forces. Jet A1 can be used in diesel engines with a less than 8% drop in output which is negligible in real terms and produces benefits in that it reduces the administration and logistic effort to support the base. Jet A1 CANNOT replace gasoline and must NOT be used in gasoline based engines.

Demand Forecast for Humanitarian Community
The demand forecast for the humanitarian community has been included into the MONUC RFP. There may be small adjustment movements around this total as operations reflect the situation on the ground, but in general the figures look robust and are based on the previous two years.

The annual demand by agency is:

<table>
<thead>
<tr>
<th>AGENCY</th>
<th>DIESEL</th>
<th>Jet A1</th>
<th>GASOLINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAO</td>
<td>126,000</td>
<td>0</td>
<td>59,508</td>
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<tr>
<td>IOM</td>
<td>12,000</td>
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DISTRIBUTION AND STORAGE

Overview

The storage and distribution of fuel within the DRC is a complex system of river transport using barges, rail with special fuel wagons, roads and air in the case of the military and MONUC. Air is not generally a commercial method of delivery. A reasonable assessment of the system is that its works fairly well in places where SEP operates. Below is a sketched diagram of the DRC supply chain.

Figure 3 - Illustration of General Distribution and Fuel Supply Chain in DRC

The supply chain is more complex when Jet A1 is tracked. Below is a diagram illustrating the system of fuel support to the airport.
Figure 4 - Illustration of Aviation Fuels General Distribution and Fuel Supply Chain in DRC

The supply chain was not designed around the current configuration of MONUC and the other UN Agencies, but has adapted to meet that demand. Due to the uncertainty of the future, MONUC investment in the additional infrastructure necessary to increase the response will, in the authors opinion, be extremely limited. The decision of most major oil companies to leave, or reduce their exposure in the downstream markets has compounded the reason why such investment will be limited and slow to materialise. The trend noted throughout Africa is for the major oil companies to move to a franchise type operation. This approach has benefits to the oil companies who continue to sell bulk product, but it has been noticed that the franchise approach does tend to limit new infrastructure investment. This is due to the fact that the new owners must recover capital investment outlaid to purchase the franchise for the stations and hence have little money left for investment.

The supply chain has a number of potential choke areas and perhaps a greater understanding of that market would assist the UN planner in making more informed decisions. The first is that the supply chain is long and therefore the time fuel spends in transit is a key factor. An example was that in Kisangani, a decision was made locally, as there were sufficient fuels to refuel two AN-124s during the period of a month. The supply replacement time by boat is 30 days, plus settling time for the fuel after transit which is an additional five days. The total is therefore 35 days. The supporting SEP depot did not have sufficient fuel after that event to then support the local status quo/programmed refuelling, thus causing the airport station to go without fuel for 15 days. It was also noted that the river vessel planned maintenance schedule does have an effect on the re-supply system for similar reasons as above. It is perhaps challenging for the planner when scheduling additional work to request a “what are the penalties of doing a change of plan” from the fuel supply chain managers.

The author could find no evidence of any strategic plans or minimum stock levels in the SEPs locations. This type of gap is perhaps most pertinent to MONUC/ WFP rather than the other agencies and tends to effect Jet A1 more than other fuels.

The author could also not find evidence of a fuel plan to support an evacuation in any sector. This would require minimum stock levels to be held in strategic locations and, of course in time of crisis, access to those fuels. In many cases up country, in small stations, this facility may be provided by simple drums of fuel held in reserve.

The system, whilst adequate for programmed traffic, struggles to meet additional, out-of-phase demand that is required by the United Nations family at times. The main users of Jet A1 are MONUC, UNHAS, ICRC and ECHO. MONUC is the largest of those users. MONUC and the Humanitarian Community also operate outside of SEP locations. In these cases, local arrangements are usually made by the Humanitarian Community. Some of these are quite inadequate, and in MONUC case, they operate using their own fuel sections, which are more expensive but a better system to ensure operations are continuous.

**Distribution**

**River**

The river is perhaps the most effective means of transportation available in the DRC. There is an adequate fleet of barges and pusher operated by government and private companies, but they are not well maintained. The main fleet is operated by Cohydro and Fina. If the oil exploration industry moves into the Central Basin, one can expect to see a cash injection into new pushers and barges.
**Rail**

The rail network was a key transportation system in the DRC. It has become barely functional over the years due to neglect. The rail network is in desperate need of major investment, and it was understood that the government intends to privatise the network to gain this investment after the election.

![Outline of Rail Network in the DRC](image)

**Road**

The road network is functional but poor. The inter-provincial link roads have been severely neglected and because of a general level of insecurity are not widely used. This is unfortunate, as the country will never develop or open up without a road network, thus allowing the insecurity through isolationism to fester.

One of the key issues that needs to be addressed to ensure cheaper fuel and a more sustainable supply chain is the linking of the major inter-provincial routes. Currently fuel has to be flown when shortages occur and the cost for that type of operation is extremely high. Perhaps the example of South Sudan and the WFP’s experience there can assist in this issue. There, investment in the road network almost eliminated the use of aircraft for transportation of bulk fuels.

It is understood that plans exist for a road improvement investment trial. It is also planned to incorporate a new UNJLC Sponsored CD-ROM generated programme that predicts the cost effectiveness of the various transportation systems and highlights where money would be best invested for a better return.

From a purely fuel prospective, the better the road conditions, the cheaper the fuel delivery system and hence the lower the price at the pump.
A SPECIAL CASE: AN INTEGRATED FUEL CONTRACT

Overview

Fuel is the life blood on any humanitarian operation, and in the DRC there is no exception. The Humanitarian Community, in a number of areas, is shielded (to a degree) from the delays caused by fuel shortages since they use local contractors. However, the local efficiency of the mission is often impaired by the lack of fuels for the generators and light vehicle fleet. This lack of fuels does effect most operation from time to time.

MONUC is the largest user of fuel in DRC. Their monthly totals of some 8 million litres of Jet A1 and 1.25 million litres of diesel dwarfs the humanitarian annual total of around 120,000 litres of diesel and 170,000 litres of Jet A1. However, the MONUC mission does not use any other fuels except gasoline for outboard motors. It is understood there is a demand for gasoline beyond which can be met by MONUC resources. This demand is that of the humanitarian missions gasoline requirement for a number of generators purchased in China and certain vehicles.

To enable this demand to be met, we suggest that the users concentrate this equipment in main city areas where SEP operates, and there be a common commercial demand for gasoline. The use of gasoline does raise a number of issues in any hot country where the flash point can reduce to a dangerous level under certain circumstances. The number of accidents with gasoline is on the increase and well documented, which would have one question why this fuel is used in a humanitarian operation. The flying of gasoline by a converted tanker aircraft is not a normal practice, and although there is no licence system in the DRC, most insurance companies will not issue a cover note for aircraft performing such practices. It was felt that care be taken when purchasing equipment, as to its suitability for the environment and mission.

MONUC operates in most parts of the country and certainly would assist the humanitarian community in availability, continuity and cost savings if the integration of the single fuel contract is achieved.

Contract

MONUC has the widest spread of locations and the cheapest fuel. Therefore, it makes sense to work as a family to equally benefit all UN Agencies.

Under existing rules, provided it does not impair the MONUC operation, the MONUC administration may agree to transfer fuel to a requesting agency. However, this is reviewed on a case by case basis. This practice also attracts a 14% administration charge by MONUC. The charge may seem excessive, and it is commercially interesting to see such high inter-departmental charges, but given the circumstances it is perhaps justifiable.

For example, when the WFP Jet A1 is issued fuel by its own contractor, the price is approximately the same price as MONUC plus the 14%, due to the MONUC discount for bulk. It was also noted, rather disparagingly, that where the humanitarian community did band together in Kinshasa and operated a joint petrol station with a contractor, the price was higher than that in the local commercial sector, due to internal administration charges. The author feels that perhaps some flexibility should be applied when price fixing to ensure value for money.

The use of the MONUC trading position would most certainly be value for money and would assist the humanitarian community by stretching its funding further. This would then show more efficiency, such that the humanitarian community could then concentrate on its core business and not administration of services.

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**Future**

MONUC has agreed to insert the Humanitarian Requirements into its Request For Prices (RFP) due to be offered to the market around August 2006. This is a huge step for MONUC and is the result of many meetings and much goodwill. Nevertheless, an equally large step is now required by the humanitarian agencies to meet the MONUC conditions. The contract is expected to be awarded to a set of contractors, which is normal in a country the size of DRC. MONUC, if the system is adopted and agreed upon, would look after the requirements of the agencies in those areas where the contractors operate. The turn key applications, applies to MONUC only. It is also expected that in a few areas contractors will not wish to supply fuels for a number of reasons. These will have to be supplied by the use of drums, but such instances will be few in number and use little fuel, thus the problem should not be over-emphasised.

The administration must be kept simple if the fuel contract is to work. It is suggested that at each location, an agency be appointed as the lead and that agency appoint an authorised representative that will check and sign all invoices for the contractor on behalf of the agencies. MONUC would review the list of invoices against a master list and verify with a cross-check when the contractor sends in its invoices. It has been suggested that the UNJLC may be a suitable interagency co-ordinator to produce the list with the authorised persons signatures and periods of office.

In an ideal world it would then pass to the UN agencies to pay. This would not work under contract law as the contract is with MONUC and therefore MONUC must pay. In order to comply with the provision of the contract, it would be necessary for MONUC to be paid to by the agencies one month in advance. There is no precedence for this, as a similar exercise is currently taking place between UNMIS and the Agencies in Sudan. This would reduce the overhead between the agencies, and allow the contractor to be paid promptly 30 days in arrears as stated in the terms and conditions of the contract. If a clerk for agency activities coordination is required, then perhaps OCHA can cover that cost so that a move forward for the common good can be formulated.

MONUC coverage of the various areas is extensive and their usage of fuel is such that discounted bulk will ensure a very good value for money. However, it is not just in the value for money context that this be examined. In a low-intensity operation where most of the agencies are operating, the distribution of fuels is a diversion from the agencies’ core businesses, and this should be taken into consideration when deciding whether to enter into a MOU for fuel supply with MONUC. The effort to move expensive barrels through several means of transport (i.e. rail, road or river and at times air) or combinations of each, can be disproportionate in time and effort. Therefore an efficient fuel supply chain will be of considerable benefit to all agencies.

The potential of moving this contract forward into a common service could be a major breakthrough within the UN family and is welcomed by the SRSG team in Kinshasa and New York. It is perhaps a suitable time for the UN to act with a common voice, saving donor funds via common services. This is a very positive step in that process.

There will be issues with this process, but nothing grave enough that goodwill and sound common sense cannot overcome them. However, once the contract is let and the system set-up, it is suggested that, from past experience, a Joint User Group (JUG) be created to set priorities and manage disputes. It is further suggested that the chairperson be the Head of UNJLC, as it is an interagency committee not involved in day-to-day operation, thus has no conflict of interest.
**Fuels Contract Format**

The administration of an integrated fuel contract could be encompassed into a MOU. We would suggest the following headings.

- Scope of MOU
- Financial Commitment and Payments
- Technical Issues
- Liability
- Coordination, Notices, Amendments and Entry Into Force
- Dispute Resolution

**Scope of MOU**

This should cover such subjects as supply period, locations and procedures.

**Financial Commitments and Payments**

This should cover letters of authorisation, cost per litre at each location, any increases in amount, and the procedure to be followed to implement those procedures. Additionally, the following should be clearly defined in this section: pre-payment issues, amounts, conditions of use and by whom, bank account details of MONUC, how MONUC will action the receipt procedures, and payment by the agencies for the fuel. Details of account closure should also be covered in this section.

**Technical Issues**

This should cover such things as the introduction of electronic fleet management into MONUC, security measures such as a dye in the fuel, and the procedure for issuing containerised fuels.

**Liability**

Whenever a service is provided and funding changes hands there is liability. This liability will require indemnity to be detailed in this section.

**Coordination, Notices, Amendments and Entry into Force**

This area should cover the fuel requirements present and future, communication channels, and how amendments are issued.

**Dispute Resolution**

This should cover how to raise notification of a problem and the procedures to be adopted. It is suggested that the JUG be the initial arbitrator for any dispute and thereafter, if necessary, between the Agency Resident Representative and MONUC Director of Administration.

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1 The MONUC price consists of the following elements: Platts (the international recognised standard price) + a fixed cost that includes transportation, contractors’ overheads and their profit + a variable that is only the price difference between the Platts figure (up or down).
Figure 6 - Logistic Map (Outlining SEP Bases)