

INCIDENTAL PAPER

**Seminar on Command, Control,
Communications, and Intelligence**

**Oil Crisis Management
A. K. Wolgast**

Guest Presentations, Spring 1980

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December 1980

Program on Information Resources Policy



Center for Information Policy Research



Harvard University

The Program on Information Resources Policy is jointly sponsored by
Harvard University and the Center for Information Policy Research.

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I-80-6

OIL CRISIS MANAGEMENT

A. K. Wolgast

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EXXON International**

“Pete” Wolgast has held a wide variety of positions in Exxon. As manager of the giant oil company’s Planning Department he speaks with some authority about the fairly elaborate, sophisticated C³I effort involved in the 1973-74 oil crisis and in the continuing critical petroleum shortage throughout the world. Wolgast’s commentary is an interesting complement to the Stovall material found in the books by Ray Vernon which outline the history of the oil crisis.

During the last year, 1979, we’ve been short of crude oil supplies. It has been very similar to the kind of situation we faced in 1973 and 1974 — not quite as bad, but similar.

As we look at what we might call the “crisis” we had in 1973 and 1974, we feel that we were pretty well set up at that time to effectively handle a crisis situation. We didn’t feel we had to go out and hire a number of new people, or come up with a complete new system. We are effectively set up to handle major changes in the world’s petroleum situation. We have a logistics system developed and in operation, and we think we have the latest in business communications, effectively led. During the embargo in ’73 and ’74 we had some longer hours and we had to work a little harder, but we didn’t have any basic change in the organization or procedures of our total international supply business. We were making more frequent updates, because things were changing very rapidly. We were having to make more frequent changes in our supply plan, and in the way we were allocating international crude supplies and scheduling their movements. We had, certainly, a significant increase in consultations with various governments around the world, dealing with the crude allocation changes we were having to make and the effects of the increases in OPEC crude prices.

Fig. 1 shows the Exxon system's supply planning and, in the shorter range, its operating and scheduling. In our supply system we're effectively working with our refining and marketing affiliates. From our Exxon International organization we give our refining and marketing affiliates, such as Esso Europe, Far Eastern or Latin American affiliates, some indication of the crude oil availability and prices we expect. From that they work out their own projections of their demands, and put together a supply plan based on their estimate of the general economic situation. For instance, our affiliate in Germany will forecast the economic activity in the country, the amount of nuclear energy, the amount of gas, the amount of coal, all the various sources of energy that are going to be available to supply the estimated energy requirements. Typically in the past, and certainly during '73 and '74, oil tended to be forecast in terms of what was required to fill in to meet the final energy requirements. That's done on an industry basis. Then each affiliate puts together its estimate of its own sales and demand. The German estimate might then be brought into London, where our Esso Europe affiliate resides, and they will be getting similar estimates from each of the 14 or 15 other European countries in which we operate. This is then put together as a Europe-wide forecast, and that is sent to our Exxon International supply and planning organization in New York, where we put together a worldwide Exxon supply/demand outlook trying to assess the industry situation. Then our other affiliates that are producers, such as Esso Middle East, will be giving us crude oil availabilities, and we give them preliminary estimates of what crude supplies we think we're going to need. Once we have all the demands in, we arrive at the crude availability and how much of the oil we're going to need. This industry analysis provides the environment in which we're going to operate.

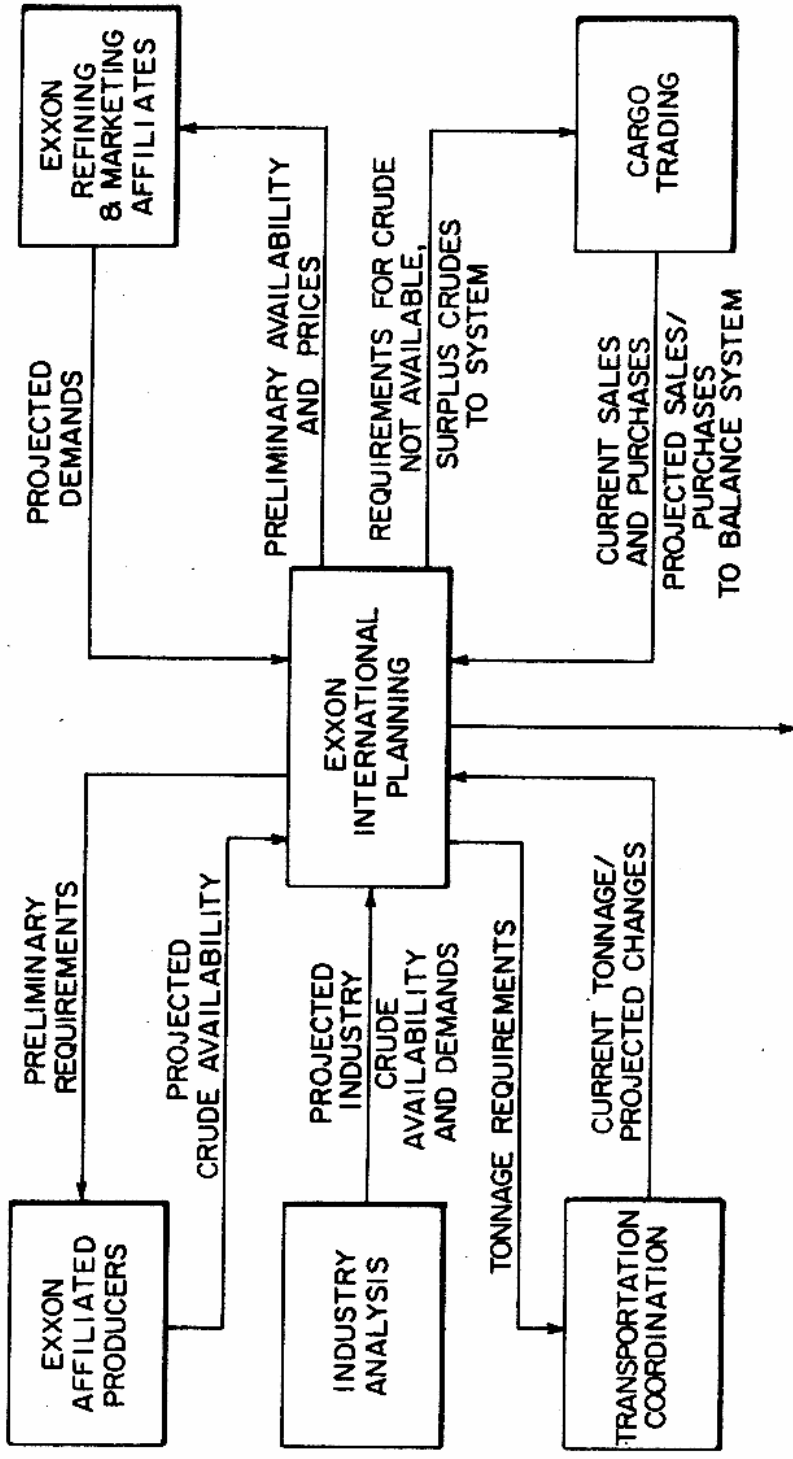
If crude supplies will be large, we might take a certain kind of action, while if we're in a situation where our industry is going to be short of crude supplies, or short of one grade of crude and long on another grade of crude, that too is going to affect some of the actions we will take in our planning. Once we determine how much oil we've got and how much we're going to have to move off to our refining and marketing affiliates, we are then in a position to do our transportation coordination and planning. That tells us what ships we currently have. When we've found out where we're going to move the crude supplies, we know what our tonnage requirements are. We may find we have too many or too few ships, and we may either charter in or charter out, depending on our situation. Those are some very short-term actions that we can take to balance our tonnage situation, providing there are ships out there to charter, and that there's a customer out there who needs to charter a tanker out.

Similarly, if we are short of oil, an organization within Exxon International called Cargo Trading will try to go around and find out where we might be able to buy some oil. If we have too much oil, they will be out trying to sell oil to customers. So from the point of view of oil supplies and tonnage these organizations are doing some very short-term trading on the market to try to balance our situation. Of course if there's a shortage of oil or ships we can't do that.

I'd like to very briefly review the way we break down our supply period. Within Exxon International we have a basic two-year worldwide supply planning period. During the 1973-74 timeframe we were on an every-six-months basis, and currently we've changed that so we're doing it every three months, because we have found that there are so many things going on in the world that even six months is not often enough. Typically we use

EXXON INTERNATIONAL RESPONSIBLE FOR IMMEDIATE 2 YEAR FORWARD PERIOD

- A. CRUDE TYPE & TRANSPORTATION REQUIREMENTS
- B. STEPS TO OBTAIN EXXON REQUIREMENTS/BALANCE CIRCUIT



1. THE TWO YEAR PLAN
2. OPERATIONS PERIOD IMPLEMENTATION
3. THE SCHEDULING PERIOD

Figure 1. The Exxon System

our very short-term planning for the next month, or three months or even maybe six months ahead, and then we go into what we call "semester planning", where we're taking the second and third quarters as a lump, looking at just the summer and the fourth and first quarters together. We do that because there is a lot of seasonality in our business; there's higher demand for heating oil and fuel oil during the fourth and first quarters, while in the summer we have higher demands for gasoline. In the winter months the industry is drawing down inventory typically at a rate of about two million barrels a day because demand is higher, so about four percent of the supply during the winter months is coming from this drawdown on inventory. In the summer months, in a typical time-frame, we are building up inventories by about two million barrels a day because demand is less than during the winter months.

Now, we also have a timeframe we call our operations supply period. This is a plan updated monthly for what we call the current semester, either a winter timeframe or a summer timeframe — so at most it will go six months ahead. This pulls together a relatively short-term plan that fits into our longer-term two-year plan. In it we're making changes that have occurred since we put together the two-year plan, trying to bring them into focus for the very short term to try to see what we're going to do in terms of changes in crude requirements or availability, the success of cargo trading and need to balance purchases, sales and exchanges, and changes in transportation requirements. In scheduling we're doing the same kind of thing, but doing it on an extremely short-term basis. Operating typically for a quarter plus a month ahead, we're looking at all the very short-term decisions we're going to be making, such as third party contractual commitments, finalizing individual loadings, confirming shipping schedules and ordering vessels into position. It's this group within our supply organization that's keeping track of where all the ships are moving, and doing things on a day-to-day basis.

Student. Do you know where your ships are all the time? You never lose them?

Wolgast. We never lose them. We are only involved with about 150 ships, so that's a lot different from the railroad car business. What we call our Logic System is an operations computer system used by our supply and transportation department that keeps track of our ships and our oil movement. It tells us where all our oil is, what the various grades are, what tankers we have available, where they are, what kinds of oil they have aboard, and if they're going the other way empty. We also put into our system, for instance, whether a tanker is scheduled to be repaired in a particular location; that may help determine where that ship may have to move to reach the right place at the right time, or meet an engagement with the shipyard for repair. This is the system we use to expedite all our international ocean movements of oil. And it's done mainly in this very short-range planning period. Not only do we use it for execution of our operations and reporting and analysis, it also gets involved in checking our billing and in the very extensive accounting we have to get into. So it's a very inclusive computer system.

In the 1973-74 crisis we were coordinating 137 vessels, and putting into the central computer all the various changes occurring during any given day. Typically our system would have an input of about 5,000 messages a day arriving from a whole host of sources. One might be a change in where we were moving a tanker, another a change in requirements at a refinery, the status of a well — or somebody else's tanker might get stuck in a channel, forcing us to make extensive changes. Another kind of message could

be somebody's assessment of a colder-than-normal period in North Europe, causing more demand for heating oil and crude in a particular area. We were moving about 200 million barrels a month, which was typical at that time — close to seven million a day, a tremendous amount of oil, which we were getting at the time from 55 suppliers. We had 70 different ports that were loading crude, and 50 refineries. There were 35 third-party customers — outside customers to whom we were selling major parcels of crude. The Cargo Trading Department was doing a lot of short-term trading. They also have done in the past a lot of what we would call "term sales": sales for a year, or two years, or even longer periods to outside customers of crude.

Student. The railroads historically got heavily into the telegraph business and owned all their own communications along the rights-of-way. Other industries have relied entirely on commercial communications. Will you give us the Exxon picture of that?

Wolgast. We lease facilities from international record carriers like ITT, RCA, and Western Union International. We have private lines to each of our affiliates, by submarine cable in some cases, by satellite in others. All are leased, privately or otherwise, from commercial carriers; we are not in the business of operating any of our own facilities. In a number of cases we have duplicate channels, but it's all commercial.

Via what is called MARISAT we can communicate to our ships directly by satellite, with voice contact. In early 1979, for example, we were talking with one of our ships out in the Persian Gulf which was in the throes of loading Iranian crude oil, and we were trying to figure out just exactly what was going on. During that first half of 1979 we had heard there were big lines, and we were questioning whether crude was being loaded out of Iran or not. That was one instance in which we could not only contact the ship and know where it was, but find out some information which was very valuable to us. When we had talked with the captain, somebody in the company said, "Hey, you'd better be careful about that, because not only can we hear, the Iranians can hear what is going on, and they may be very unhappy that we are talking to the ship captain to find out whether Iranian oil is being loaded or not; and if we continue that type of thing they might just decide to shut us off." (Of course that would not make any difference today, as they have since shut us off.)

We use high-speed data transmission; for example, messages between our New York and London communications centers for subsequent retransmission move at 9600 bits per second. We use normal commercial communications lines — telephone and cable, and for direct communication to our far-flung exploration teams we use voice radio, teletype and data transmission facilities. We are always testing and evaluating potential communication systems to determine their applicability to Exxon's needs; currently we're looking at voice and data concentration, which permits existing communication lines to be used more heavily.

Student. Have you done anything with encryption to insure the products? I would think, not just with Iran, but other oil companies, the stock market, things like that, having information as to who is loading where and what's going on might be very valuable to your competitors. Do you normally encrypt that information, or is most of it open?

Wolgast. When we talk on the telephone it is usually open, although we have some scramblers. I was out in the Middle East for a couple of years, as president of a small company called Exxon Middle East Industries, and we had something I could talk into that scrambled everything up. But that's unusual, so if the Russians tune in on our messages from their embassy in Washington, as they are reputed to be able to do, I think we are pretty open to that.

Student. Is there any evidence that the Soviets are tapping oil business communication lines, using the data for their own crude purchases, or whatever?

Wolgast. I doubt we would be able to assess that. The Russians are not a major factor in the international oil business, so the amount of oil they trade internationally is relatively small. I don't know that we would be able to see from their actions if they had intercepted, say, some messages or some information that we might consider private.

Student. Has your system at some point crashed or been inoperable, and in that case what would you do?

Wolgast. We've never had that problem. It's never crashed, to the best of my knowledge. In a number of cases we have alternate routes to move messages, so if somebody shot down the satellite, we would have to rely on voice or telex communications with our ships, which is not as satisfactory. Possibly in some locations we might go for some period, for several days maybe, without being able to communicate. So we would not be as efficient if we lost a satellite.

Student. With your fleet, I imagine some of the ships are on long-term hire?

Wolgast. Yes. We own about 75 percent of our fleet. For the rest, we might time-charter on a long-term basis maybe another 15-20 percent, and leave about five percent to be spot-chartered. It depends on our assessment of particular grades of tankers. We may decide, looking two or three years ahead, that because we think industry is going to be extremely long on a particular size tanker, we won't cover ourselves on it now. We'll wait until the time arrives and try to spot-charter, maybe at very low rates. On the other hand, if we expect industry to be short of this kind of tanker, we may plan to go out and build, or cover, somehow, ahead of time.

Student. Will all ships have the same communications facilities? I mean, is the same grade of service purchased to communicate with all the ships?

Wolgast. No. There can very definitely be a difference, particularly since ships that we're chartering on a term basis may not have all the capabilities our own tankers have. I'm not sure that all the ships we charter have MARISAT kinds of facilities. If we chartered a tanker for a long time, we might feel it was worth our while to refit its communications; but for a spot-charter or a very short term charter we could get along without that for the short time it was going to be in our service.

Now, it is not only communications onboard a ship that we look at when we are chartering; there are a lot of other things that we look at. We want to make sure that we have a

seaworthy ship, and that it isn't going to leak, obviously. We have people who go around and look at all the various ships we might charter, and try to determine whether or not they are in good shape. We keep a list of tankers, and if they are not in good shape we won't charter them, because we feel that would not be responsive to environmental considerations. Among tankers that industry has had trouble with in recent years, I think the Argo Merchant was one that we had looked at and decided it was not seaworthy, and was not a ship we would charter.

Student. You say, then, you could go with 20 percent of your fleet, having no satellite communication capability, and get in touch with them once every three days, once a week, or something?

Wolgast. Oh, typically we get in touch with them more often than that, but we don't really need to for most of our operation, because during most of a voyage from, say, the Persian Gulf to North Europe there is not very much need to get in touch. Maybe, right at the end, we might decide to divert the ship. Supposing it was destined for Rotterdam to start out with, we might decide to send it to Falais or Milfordhaven or somewhere in the U.K. instead — that's a last-minute decision in an area where it's very easy to communicate with the ship.

Student. Suppose somewhere along the way to the Cape of Good Hope you decide you want to go to Puerto Rico? Is that a common occurrence?

Wolgast. No, it's not. We've got a fair volume of oil going to North Europe, we've got a fairly sizeable volume going to the U.S., and it's relatively unusual that we would have to make a change for ships that are going either to the Eastern Hemisphere or to the Western Hemisphere. They are pretty much going one way or the other. One tanker just does not make that much difference, because usually enough others are coming along behind it.

Student. But if you were to try and divert, would you normally divert the ship with satellite communication? Or would the time differentials be so unimportant that you would try to do it through telex?

Wolgast. Satellite communication would be the easiest way to get in touch.

Student. Would you pick the ship on the basis of path?

Wolgast. No, I think you would pick it based on location. Another important criterion might be the particular grade of crude aboard, because different refineries handle different grades of crude. Or it might depend on the particular requirements, the demand in a particular country.

Student. What flag do most of your Esso-owned vessels fly?

Wolgast. Liberian, Panamanian, Bahamian . . . probably we have more Panamanian and Bahamian tankers in the international business than anything else.

Student. I would imagine the 1973 crisis was when your system was the most over-

loaded, had the greatest message traffic. What sort of capacity do you think you have in your communications system?

Wolgast. We were not concerned about being overflowed. I don't know what kind of capacity we've got, though — how laden we would have to get before we really had a problem in communication, before our communication system might not be capable of meeting our needs.

Student. Short of nuclear war.

Wolgast. As best I know the situation, we're set up so that we feel relatively comfortable that we have adequate capacity to be able to handle a major crisis.

Student. What sort of telephone communications do you have?

Wolgast. Well, there are lines that we dial up, and there are "dedicated" lines, which are leased to us, which we use on a full-time basis.

Student. What is your Far Eastern telecommunications situation?

Wolgast. Singapore is our major center for telecommunications in the Far East. Each of our affiliates, like Hong Kong, Tokyo, Australia, have their inputs, but Singapore is our major center for all Far East traffic.

The way in which our products evolve from the basic crude involves a considerable amount of communication (Fig. 2). When the regional affiliates, such as Esso Europe, enter their requirements for oil into the system based on agreed total monthly allocations assigned by our EIC Supply Department, the requirements are entered as specific step-sized increments we call "items." An item could be one million barrels, slated for arrival at a specific port or ports within certain date ranges. Fulfillment of this requirement is confirmed by our New York office, which enters the volumes it expects to have available to supply. The regions then see how their requirements will be satisfied, and may make adjustments; so we have a dialogue between headquarters and the regions. When allocation decisions are made, the names of the carrying vessels are entered against the specific requirements or "items," which then become "voyages." The Logics System has checks and balances to keep SOD and TOD scheduling (operations) and the regions in agreement on oil delivery dates; this is called "change processing." Unilateral changes in loading dates are not tolerated once SOD has confirmed the supplies. Logics automatically notifies SOD whenever the loading date is changed — for example, by a vessel delay — and the system preserves the picture of the situation prior to the change until SOD accepts the change. Another ship may have to be substituted.

Another example of the Logics operation is the Vessel Control Subsystem, which constructs voyages and continually revises the itineraries of the Exxon fleet; this responds with vessel itineraries within three seconds of entering the vessel's name. Vessel Control contains a complete simulation of the international oil shipping industry, basing its calculations on the voyages underway or scheduled for the vessel. Voyage plots take into consideration load and discharge ports, load and ballast speeds, the canals the vessel may have to traverse and the route it is expected to follow. It also considers supply confirmation, availability of supplies, when the customer indicates he will have capacity to receive

EVOLUTION OF AN ITEM.
INVOLVES A CONSIDERABLE AMOUNT OF COMMUNICATION

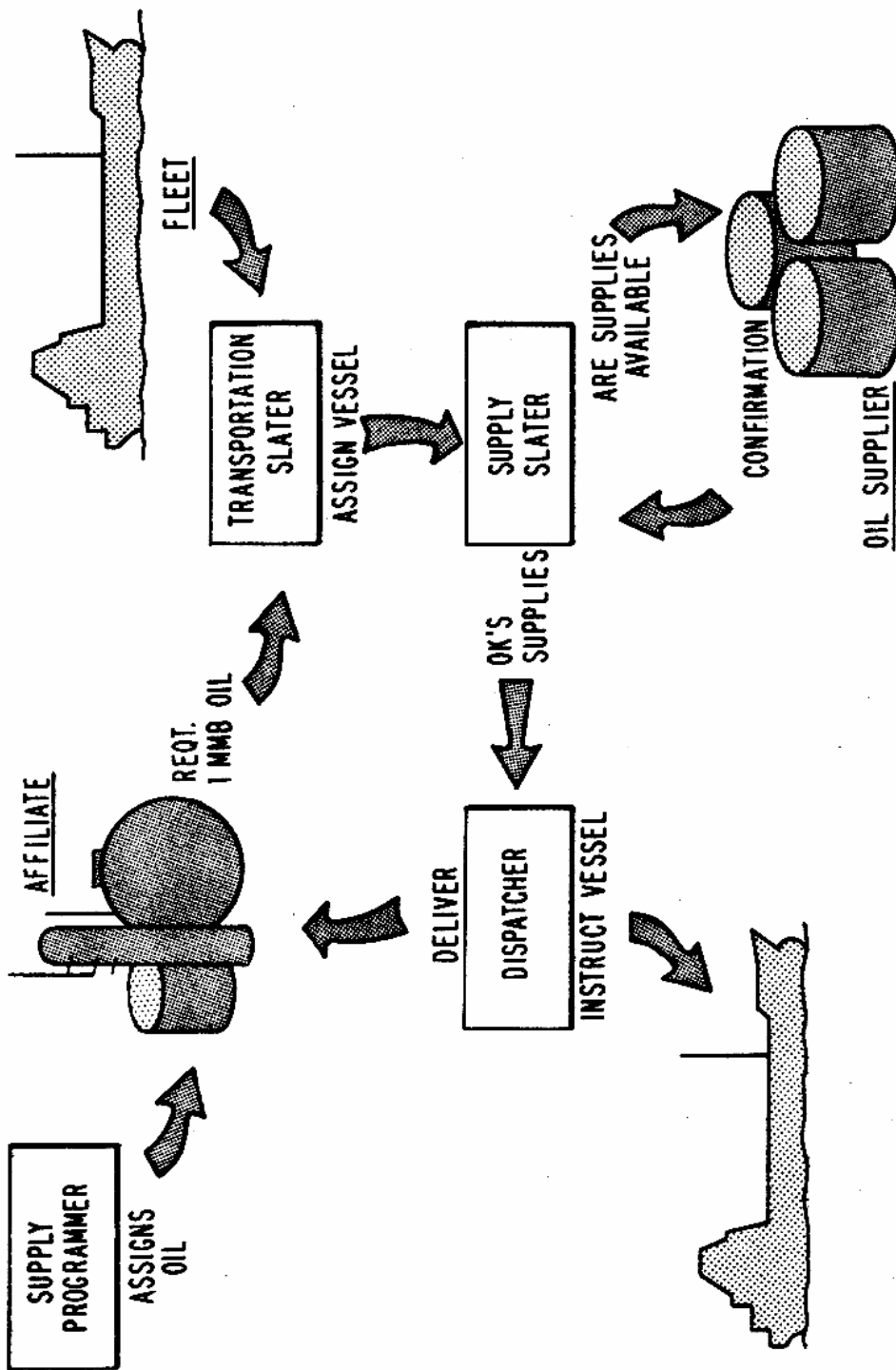


Figure 2. Evolution of an Item

the cargo, and delays that can be expected to be associated with certain voyages. It makes sure the voyage doesn't conflict with repairs which may have been scheduled for the vessel, and plots the return voyage to the next loading area, including the date when the vessel will next be available. All this is replotted and adjusted as changes occur. We have ten data bases, 200 screens giving access to data, 200 online programs and 300 batch programs backing up this effort. Data arriving by Telex from the ship captains is entered into Logics and is used as the basis for revisions and adjustments. Actual arrival and sail times, volume loads and discharges, as they arrive, permit Logics to perform its billing, reporting and analysis functions. So you see that Logics is a unique kind of system — much more than merely a data entry and retrieval system.

Now, once a supply programmer in Exxon International assigns oil to an affiliate, a person we call a "transportation slater" assigns a vessel to move that oil to an affiliate. These supply programmers and transportation slaters are all located on the twenty-fourth and twenty-fifth floors of the Exxon building in New York City. The affiliate may be in Europe, in the Far East, in Latin America; and the fleet can be anywhere in the world, wherever a ship happens to be handy when the transportation slater needs one. Somebody in our supply organization in New York would say, this particular ship is going to be coming into Saudi Arabia at the time when this oil is available, and we need to move it to Japan, and assign the vessel. Then the person who is slating the oil on a day-to-day basis, once that ship moves in, would go ahead and approve the supplies. Working with ARAMCO, for instance, he would name a particular ship, maybe two weeks ahead of time, that would be coming in to Rosta Nora in Saudi Arabia, confirm that that ship was coming in and get agreement from ARAMCO that they would have supplies for it. It would be okayed by ARAMCO, and all the arrangements would be made — how many barrels of each grade of ARAMCO crude could be put on it, when it was going to arrive, and when it would be loaded.

Student. The brains of this entire system are on Sixth Avenue in New York. So if there is an eastern seaboard power failure, how long can the system go headless?

Wolgast. We have our own generator, so as far as power is concerned we are not going to go headless. If for some reason Manhattan shuts down — if a terrorist group puts an atomic bomb in Manhattan so nobody can come in — we also have an alternate location out in Floren Park, New Jersey, where people can get together.

Student. No airborne command posts?

Wolgast. We don't have an airborne command post. But we do have a setup so that if in an emergency we can't get to either one of those locations, we can work from our homes. We are set up so that our telephone operation can be tied into our home telephones, so that in an emergency, instead of having to dial long distance, we can call direct.

Student. If the telephone lines go down, is that coordinated with the phone company so that you'd be part of their emergency plans, or not?

Wolgast. I can't answer your question. I don't know.

Student. How long would it take to get the phone system into your home?

Wolgast. My understanding is that it is supposed to be available in a couple of hours, once we've decided to go ahead. I guess it depends on what the emergency is, and maybe how the telephone company happens to be affected too.

Student. Have you done any trial runs?

Wolgast. Yes.

Student. Is most of the data in your Logics system in some sort of data base, and do you have file card backups? I mean, if your computer system happens to crash or suffer a power failure, what kind of procedure would you use to continue operations without your central computer? Or do you have alternate sites, alternate data bases — do you store data incrementally out in the Utah salt mines?

Wolgast. Our New York and New Jersey bases are relatively close together. I suppose if we lost both of them as well as the people in New York, who are trying to coordinate this thing worldwide, we'd have a real problem. But if we lost our computer network, yet still had the people that were running it, I feel we would still be in reasonably good shape. We would not be as efficient as we are right now; we would probably lose out a little bit. But we operated for years without a system like this. We've got a lot of people who, as recently as eight or ten years ago, were doing things by hand. I feel confident we could continue to operate at reduced capacity, or reduced efficiency, even without the computers. The oil would still move, we just would not make as fine-grained economic decisions as we are making right now.

Student. Are the affiliates capable of taking over the routing actions you do out of the central office — for example, Esso Europe? Or would the units not survive without the center?

Wolgast. I think it would be very difficult. The problem is the interaction among Europe, the Far East and the U.S. in coordinating the Middle East or African oil that's going. Let's put it like this: if all of us in the New York-New Jersey area suddenly disappeared with our system, the people out in the regions would continually come and work together. In fact, this morning, when I left, we had a party in from the Supply Group, because we are currently putting together our quarterly supply plan that will go to top management within ten days. People from all the regions were in looking at the current status of the supply planning and providing their final inputs. A lot of the people in the regions have worked in New York at various times, so they have had that kind of experience — we have a tremendous interchange of people, and that's very important in our total system. We, in New York, are not irreplaceable, because the regions could put a central staff together.

Student. Are your tankers owned by Exxon International, or by the affiliates?

Wolgast. A very high proportion of them are owned by Exxon International; the affiliates do own some.

Student. So if somehow central authority disappeared, who would own or control those tankers? Where would they go?

Wolgast. Well, Exxon owns the tankers through our subsidiaries, so even if our headquarters organization in New York disappeared we would still have our stockholders, who own Exxon, and we would still have Exxon personnel who would somehow get together and set up another centralized coordinating group to decide where all the tankers were going to go and who was going to pick up the oil.

Student. Most of the brokerage firms and banks in major money centers have access to three or four alternate computers. At Putton, for example, there were four major computers any one of which could handle their entire communications system with two thousand branches, and it was just a matter of literally picking up a couple of floppy disks and carrying them over. Does Exxon have a similar sort of situation? Or are you dependent on one computer?

Wolgast. Well, we've got more computers out in Floren Park than we do in New York. I can't tell you how many we have in our New York building, because I'm not involved with physically running the computer operation. A lot of what we do with our computers tends to be over telephone lines back and forth to our foreign partners' organizations. Our mathematics and systems group is in Floren Park, and I don't know how many computers they've got out there.

I thought I would describe briefly what we saw of the embargo situation back in 1973, how it affected us, and how we reacted (Table 1). Following the first announcement by AOPEC (the Arab Oil Producing and Exporting Companies) in October 1973, first Saudi Arabia announced a ten percent cutback, Qatar and Libya imposed a five percent cutback, and Abu Dhabi and Algeria placed an embargo on the U.S., all on October 18. Other countries came along a few days later with embargoes and additional cutbacks. It seemed as if every day we were getting more and more changes and constrictions put on the system: Kuwait with a ten percent cutback and embargo on the U.S.; Qatar and Algeria with embargoes on the U.S.; Algeria with an embargo on the Netherlands. Nationalization in Iraq — "U.K. interests" (British Petroleum Company and part of Royal Dutch Shell) and U.S. interests, which had been nationalized not long before. By late October and early November embargoes were in effect on the U.S. and Netherlands by all the Arab oil producing countries, and we were coping with a ten percent cutback in production by those countries as well.

A ten percent production cutback, however, as first announced, actually resulted in a 20 percent reduction in available supplies. In detail it happened this way. Assume that the Saudis were producing eight million barrels per day in September 1973, and that 800 thousand barrels a day were moving to areas subsequently embargoed. The difference is 7.2 million barrels per day. Subtracting ten percent of eight million barrels per day, or another 800 thousand barrels per day, we are left with only 6.4 million barrels per day, or 80 percent of the September 1973 production levels.

The Arab oil producers were not a united front at first. Iraq did not go along with the production cutbacks — they had nationalized U.S. interests on October 7, before the embargo was announced. They continued production. However, they did join in the embargo.

Table 1. The Magnitude of the Embargo Problem

- First announcement by AOPEC on October 17, 1973.
 - Immediate 5% production cutback from September, 1973.
 - Additional 5% production cutback in each succeeding month.
- Rapidly escalating steps in following two weeks.

Date	Country	Production Cutback, %	Embargoes	
			U.S.	Neth.
Oct. 18	Saudi Arabia	10		
	Qatar	10		
	Libya	5		
	Abu Dhabi		X	
	Algeria		X	
Oct. 19	Libya		X	
Oct. 20	Bahrain	5	X	
	Saudi Arabia		X	
	Algeria	10		
Oct. 20	Iraq			Nationalize U.K. Interests
Oct. 21	Kuwait	10	X	
	Dubai		X	
	Qatar		X	
	Algeria			X
Oct. 23/ Nov. 2	Remaining Above Countries		X	

- Also embargoed were export refineries, wherever located, to the extent product deliveries made to U.S. or U.S. military (Guam, NWI, Bahamas, Trinidad, etc.).
- Net impact was a 20% reduction in crude production.
- + Kuwait and Saudi Arabia first shut in liftings to embargoed nations and then applied percentage.

The chronology went something like this. Canada was originally embargoed, but this was shortly relaxed to permit imports for domestic consumption. In response to support received from the African nations, the Arabs also embargoed Portugal, South Africa and Rhodesia. The original embargo action defined nations still eligible to receive oil — “preferred” countries, which were to receive 100% of the volumes they had received in the previous month, September. “Neutral” countries were to get a pro rata share of the remaining available crude, based on their September 1973 volumes.

The AOPEC meeting of November 4 raised the production cutback to 25 percent, including embargoed volumes. The eligible country definitions were finalized, and the number of preferred nations was increased. Libya and Algeria announced cutback formulas somewhat different from the other producers’ — for example, Libya did not ban sales to Caribbean export refineries until December 21 — and that had to be taken into account. AOPEC met again on November 26-27 and December 8, and increased the production cutback by five percent for December, exempting Europe from the cut. A new definition of eligible countries was established and “most favored” nations received exports to meet their current demand. The net impact was a slight increase in production. At the OPEC/AOPEC meeting on December 22 the production cutbacks were decreased from 25 to 15 percent for January 1974. During January and February rumors of an end to the boycott heightened speculation, and a scheduled February meeting of AOPEC was cancelled. Henry Kissinger’s shuttle diplomacy bore fruit, and at the AOPEC meeting on March 18, 1974 the U.S. embargo was lifted with Syria and Libya dissenting. We’ll look at that situation more closely as we go along.

So we had less crude oil supplies as well as a number of countries in which we couldn’t take care of oil. One other aspect of it was that we could not take crude oil to export refineries, such as Singapore, and make products from Arab oil and sell them to the U.S. military. This was specifically mentioned as another embargo by those countries.

Student. That implies, on the part of AOPEC, a significant understanding of the worldwide structure of Exxon and the other oil companies.

Wolgast. Well, I think they are pretty sophisticated, and have a pretty good knowledge where their crude goes, and for what purposes.

Student. This comes back to the question of security implications. Do you have any concern one way or the other over having open communications from the point of view of your suppliers? Is it in your interest to have open communications so that the AOPEC countries feel secure in their intelligence about where your material goes in this type of situation?

Wolgast. First of all they know where it goes, because we have to show a bill of lading for each ship. The document shows what crude is on that ship and where it is going. There’s another way they can find out what happens: Lloyds of London tracks all the ships around the world. If they have any doubt, they can find out from Lloyds what ships called, where those ships were cited next, and where they unloaded their crude. In fact, one of the things Exxon does is track industry. We get the Lloyds list, showing which ships picked up oil in the Persian Gulf and where they went, and we know who owned the ships. We put together part of our industry analysis trying to figure out what other

companies do. There is a little time lag in the Lloyds lists — sometimes three months, sometimes longer than that.

Student. So there is an open-board chess game?

Wolgast. Yes. We try to figure out what other companies are doing, how much oil volume they are moving from place to place. I don't know whether other companies are doing this or not. I might guess that some do.

Student. Do you have any feeling that, if you did switch to encrypted communications for your operations, this would upset the Saudis or other Arab countries?

Wolgast. I don't know that it would. But in the normal course of our business, I don't think we'd regard as highly confidential our directions to one five hundred thousand ton tanker concerning oil loading volume or destination — unless a war is on and a Soviet submarine is out there trying to sink the tanker.

Student. The Arab nations embargoed deliveries made to the U.S. military — but if 40 percent of the oil sent to, say, Aruba refining comes from Saudi Arabia or the Middle East countries, and ten percent of the refined part goes to the U.S. military, how would the Saudis know where that ten percent came from? Their allocation might have come from Venezuela.

Wolgast. That's one of the decisions each company had to make: how to apply the directive from the Saudi Arabian Government. Some companies (which I won't name) effectively ignored that decision. What we tried to do was, for instance, assess how much of the crude oil in the Singapore refinery was Saudi crude and how much was crude from, say, non-Arab sources; and we cut the U.S. military back by the percentage that was Saudi crude. In cutting them back, one of the things we did was talk with them about what their supply situation was, and we told them that if because of this decision they were having a major supply problem, we would work with them to try to make up supplies somehow, if not from that particular refinery, then from another refinery. So we were having extensive discussions with the U.S. military about their supply situation all during the period of the embargoes. And the kind of information input we were getting from the Defense Department was that they had adequate supplies.

Now, in spite of this, in late 1974 or '75, Senator Jackson had an inquiry in Washington and called some of our executives. He accused us of being unpatriotic, castigated the companies that had cut back the U.S. military, and said we were not acting in the U.S.' best interest. I felt he was trying to make political headlines when he made the comments, because he was aware that we had been working very closely with the U.S. military to make sure that they had adequate supplies, but he was able to twist what we had done in cutting them back, and made headlines with his comments.

Returning to the embargo problem, let's look at the definitions the Arabs made. As we've seen, they listed some "preferred" countries to which they said we could supply 100 percent of the September 1973 volumes. "Neutral" countries were to get a pro rata share of the crude remaining after we had first provided the preferred countries. So the neutral countries were really being cut back more than the basic cutback, because the preferred

countries got the oil off the top. The original list of preferred countries was France, Spain, the United Kingdom, Jordan, Lebanon, Malaysia, Pakistan, Tunisia and Egypt. I think there was a definite preference being given to Moslem countries. I think some countries were given preference because they had refused the U.S. when we tried to use their airports for flying supplies to Israel. And the French have just made it a habit to go out to the Middle East and be extremely friendly. (If we counted on friends like the French we'd be in pretty bad shape, because they were doing everything they could to undermine U.S. interests for their own benefit. They were deliberately trying to play up our involvement with Israel, to undermine us with the Arabs.) The U.K. was on the list because they were having a coal strike. The Arabs tend to have a special affinity for London. I think Spain was on the list because they refused to let us land there. Some countries were later added to the preferred list: India, and all the African states that had broken relationships with Israel. And then Japan, Belgium and the Philippines were added at the December meeting. Then they came up with still another list of "most favored nations", and these by their definition were nations to which the companies were to provide requirements based on their current demands. That left an opportunity for a little bit of games-playing. The "most favored nations" were, first, the African and Islamic nations, and then the U.K., because of the coal strike it was experiencing.

So we were going through continual change and revision of definitions, meanwhile trying to work within our system of moving oil and trying to be consistent with the directives. And we felt, as companies, that we had to go along with the directives, because the Saudis told us that the alternative was outright nationalization. We felt under the circumstances that it was far better for Exxon and for the U.S. interest to be in there, and continue to control crude supplies as far as possible — at least in making the final decisions on where the crude was going to go — even though we were allocating on a country-by-country basis based on the broad overall Saudi directives.

And then we ran into a situation just within ARAMCO: we had to fight with our other ARAMCO partners on who was going to get how much crude oil going into France. We knew that ARAMCO as a whole would move into France a volume equal to what had been imported into France during September 1973. There were antitrust considerations that we had to be very careful about, that in bargaining with one another, we were not involved in, say, trying to split up a share of the market in France.

As we looked at our situation we felt we had quite a number of different constraints. From a political point of view we had all the constraints that were being put on us by the producing countries. We had a lot of political concerns in regard to the consuming countries. We especially had to adequately satisfy the requirements of all those on the preferred list — we had to do that, because if we didn't we would have violated the directives of the producing countries. But we didn't want to give those countries any more than we had to, because we were short of oil worldwide, and we wanted to have the oil for other areas. From a company point of view, we were trying, with the oil we had left, to "evenly spread the pain" among the neutral countries, back-filling-in with Iranian oil, because the Iranians increased production during this period, and so did the Venezuelans. This put us in a position to move Iranian oil to the U.S. and the Netherlands. We pulled Iranian oil out of places like the U.K. or Japan, so that the cutback those countries had to endure was approximately the same percentage as for the U.S. and the Netherlands, in spite of the fact that we were the countries that were embargoed. If we had just let the

system go the way the Arabs tried to make it go, the embargoed countries would have suffered to a much more significant extent. By compensating, we tried to spread the shortage evenly.

Student. What was the Arabs' reaction to that dilution of their intent?

Wolgast. They seemed to accept it. We certainly did not consult with them. We just went ahead and did it, and there was no reaction — to the best of my knowledge it was never mentioned.

Apart from the political constraints, we had technical constraints — in our reallocation we still had to find a way to provide the type of crudes each refinery was capable of handling. Other constraints were commercial, including the price increases OPEC had established, and the handling of joint ventures, such as ARAMCO, in which entitlements to production came into conflict with destination limitations. Within the scope of each venture we had to do some internal trading to achieve our balance. Finally we felt the impact of legal constraints, including the U.S. antitrust laws. In some cases contractual obligations were reduced by force majeure.

The consumer countries exerted some pressures. Traditional export refineries such as Italy were restricting their product exports, which hampered the distribution process. Italy subsequently relaxed its controls in response to company pressures for fair allocation. Various governments lodged protests and applied pressure over diversion of crude to other nations; in particular the nations on the preferred and most favored nations lists wanted to get their full allocation of non-AOPEC crudes. Exxon's affiliates took most of the heat. We closely coordinated consultations with governments to painstakingly explain the allocation system, since failure to redistribute supplies equitably would simply invite greater governmental intervention.

In the meantime the OPEC negotiations between the crude producers and the governments of the producing countries broke down just before the embargo. They were looking for changes in the 1971 Tehran Agreement and the Geneva Agreements of 1971 and 1973, both of which posted price changes to reflect the increasing value of crudes. On October 16 OPEC announced a unilateral 70 percent increase in the posted prices for crude. Market prices for base load supplies rose. At the December OPEC meeting postings were again significantly increased, to the \$11.65 per barrel level for Arabian light, effective in January 1974. At the same time prices for "participation oil" increased to about the \$10.85 per barrel level. The overall impact of all this maneuvering was almost a quadrupling of costs and prices between early 1973 and early 1974.

Student. I take it this was the total allocation system? The price mechanism didn't play a role here, in the fact that the United States companies might be able to bid higher prices for Venezuelan backfill? Did you reallocate based on political criteria, or were the criteria economic?

Wolgast. They were not economic criteria (I might say that during 1979 we have had the same kind of decision making to go through); for the most part this is not an economic analysis. What we try to do is make sure that all regions of the world are getting crude supplies at about the same cost — so that, for instance, we're now giving the U.S. a lot of Arabian crude because Arabian crude was lower priced for most of 1979. We try to share

our lower-priced crudes equitably all around the world so that each of our regions gets about the same average cost of crude. We think that is the most defensible way.

Student. I take it that's because of the potential for government interference on the multinational level? I mean, it seems to go against the grain, in terms of maximizing profits.

Wolgast. We've done a whole lot of things. I can talk for hours right now about what we did during 1979, decisions that were made that did not maximize profits.

Student. Well, you said "guidance from the government" — I was wondering what kind of information you had to get.

Wolgast. Well, during the embargo we tried to allocate on what we thought was a fair and equitable basis, and cut back everybody except the countries that were directed to get their full requirements. Among the countries that were not "preferred", we were trying to share the pain equally so that almost everybody was cut back by about six or seven percent at the worst. The U.S. was cut back by 7.4 percent, and the average of the rest of the world was 6.7 percent, so we were a little bit worse in this country; but that difference of seven-tenths of a percent was infinitesimal.

Student. Are the decimal percentages total supply, or percentages of imported supply?

Wolgast. Total oil supply.

Student. Would the U.S. have gotten a larger than seven percent cutback on the imported portion, more like 14 percent?

Wolgast. Yes, I suppose that's right. Or you can base it on total energy supply, in which case the U.S. was down by 3.5 percent and the rest of the world was down by 3.3 percent. Now, of course, both numbers are tempered by the fact that a large amount of our own energy is indigenous energy, and at that time we were not importing much crude oil compared to the total. Oil provides 47 percent of total energy in the United States, and 49 percent in the rest of the world. We were not importing as large a percentage of crude oil then as we are now. Looking at the U.S. imports of crude oil by country of origin during August or September 1973, before the crisis developed, and then in January and February 1974, when we were in the midst of it, our Iranian crude oil supplies in the U.S. on an industry-wide basis were up by 200,000 barrels a day. In Exxon and throughout the industry, a significant portion of the cutback was being replaced with more Iranian oil which we were stripping out of other countries and bringing into the embargoed countries.

Student. Since you've got to reallocate in such a big way, what kind of procedures are there for the reallocation process? In your office, how does the whole reallocation process change when you regroup oil supplies?

Wolgast. First of all we've got to decide on our reallocation philosophy. What we decided to do was reallocate based on demand in the various parts of the world. Let's say

the U.S. was 30 percent of our demand; we would then give the U.S. 30 percent of the crude in our allocation pool. Now maybe that would not meet our full requirements, maybe we would fall short — but we would allocate all the crude we had available for allocation based on the percentage of each region's demand during a base period.

Student. A base period is how far back from the present time?

Wolgast. It depends. It can be a base period looking back; but at times we have decided that going back was unfair because the situation had changed so much, so sometimes we will base our allocation on a forward supply plan made before the crisis, on our estimate of demand, and use that to allocate our crude supplies. We feel that any time we get into this kind of situation we are probably going to be involved — at some time in the future or even right away — in trying to justify what we have done to various consuming country governments. So we feel that whatever we try to do is going to have to be open, that we must be prepared to show governments and the public that our actions are fair and defensible on a worldwide basis.

On the whole, I might add, we have been judged to have done a fair and equitable job of reallocation during the crisis period. The Senate Committee on Foreign Relations made use of a report prepared in January 1975 by the Federal Energy Administration which found that the U.S. oil companies helped to blunt the edge of the Arab oil weapon by redistributing global supplies so that the constriction was fairly evenly spread when measured against current demand. The U.S. companies were found to have been more responsive to their assessment of the long-term implications of their allocations than to their own short-term interests, and the FEA said that it would be difficult to imagine a more equitable plan for allocating reduced supplies. The report found the U.S. oil companies' distribution system had considerable flexibility, permitting them to reallocate supplies on short notice in spite of a wide variety of technological and transportation difficulties. No evidence was found that the Arab nations exerted pressure on the U.S. oil companies regarding their allocation of non-Arab supplies. While some pressure from consuming nation governments was noted, it was not regarded as excessive; in most cases the governments were satisfied by industry assurances that supplies were being equitably distributed. The U.S. oil companies nevertheless agreed that they were called upon to make difficult, and potentially volatile, political decisions during the embargo, and that those decisions were beyond the realm of their normal corporate concerns.

Oettinger. I can't help comparing what you said to the regulatory process, say in a U.S. administrative agency, where a political judgment is made in the first instance as to the outcome, or in this case the fairness, of an allocation scheme. You then pick the analytical backing (the forward or backward allocation or some other thing) with an eye in this case to justification in some eventual brouhaha with the U.S. Congress or the Saudis or somebody — in the case of an administrative agency, usually with the courts, perhaps with the Congress. If you play it right, the decision is politically acceptable, the analytical basis provides you with the wherewithal to meet the critics, and everybody survives it. I find it fascinating that I can transpose this private-sector decision making into an almost exact parallel with the administrative process.

Wolgast. Let me tell you what goes on: while the decision-making may be done in New York, our headquarters are not the ultimate ones who are making the supply and transportation decision, because we will have supply representatives coming in from Esso Europe, from our Far East affiliate, from our Latin American affiliates, from Imperial in Canada, from our U.S. affiliate in Houston — and we get all those people together in a big room and talk about what's the fairest way to allocate. We will have contingency plans, yes, but sometimes people will come up with reasons why the contingency plan is not fair. And often the regions will make allocation proposals, and once you do the analysis and figure out what they came in and recommended, you find that the proposal, for one reason or another, happens to favor that particular region getting more crude. So we then have to try to sit as Exxon International and work with these regions, and come up with what we can as a group, considering all these various organizations, recommend within the company, as a fair way to go about it. Very often, in a situation like this, the supply people can't agree. Then we have to "bump it up", maybe to the chief executives' level, and the chief executives of each of the regions come in and discuss it.

Student. I have heard, within the past two weeks, first from a high official of the French government, and then from the U.S. Deputy Secretary of Energy, that the probability of losing half the Saudi Arabian production in the next two years is 1.0 (you may differ on the probability level). Given these kinds of probability levels, is everybody at Exxon going to wander into a room and sit down and say, "Well, guys, where do we start?"

Wolgast. No. One of the things I had to miss today was a meeting of all the corporate planning managers from all our regions, talking about various things that we ought to be planning on a contingency basis. One of the things I was fighting as I left yesterday was that Exxon doesn't have a plan right now for what happens if Saudi Arabia is shut down. I think we ought to have such a plan. But people don't want to face up to that, because they see it as total panic and feel there isn't anything possible to do about it. Well, I think we ought to have a plan that says, "If Saudi Arabia is shut down tomorrow, here's how we're going to operate." Even though it's a complete disaster to our company, I think we've got to know what we're going to do, and you can paint a lot of different scenarios around that. Exxon could lose oil from Saudi Arabia, but that oil may be available to industry. Another important criterion is the length of time it's going to be shut down. But I think very definitely we've got to have a plan, and right now we don't have one in Saudi Arabia.

Student. You haven't gotten any U.S. or multilateral governmental guidance, in spite of the Deputy Secretary's high-probability estimate of Saudi Arabia's crude problems? I take it that the U.S. government isn't pounding on your door to develop, or influence you to develop, contingency plans?

Wolgast. No, they've never involved themselves in that. I might hope that the U.S. government has a contingency plan.

Student. If so, they haven't coordinated it with the people who produce, or with the transports to supply the crude oil. It would seem that people might as well be storing blankets as working on crude oil.

Wolgast. I'd be willing to bet you the U.S. government no more has a contingency plan if Saudi Arabia's shut down than Exxon does. I guess the International Energy Agency has one, in that there is a sharing mechanism set up so that if suddenly the world is short by some volume of oil, and if it's over seven percent with some other detailed complications (seven percent is a trigger mechanism) there is some basis for sharing oil supplies around the world that all the consuming countries have agreed on. I think the IEA originally set it up because of some concerns that Kissinger had when he was Secretary of State. The oil companies are very concerned that if we get into the sharing mechanism that has been set up by the IEA it's going to be very difficult, because that mechanism is not very well defined, and has quite a number of inequities.

Student. When all the people come in from the different regions to discuss allocations, to what extent does the International Division oversee or justify their demands and make tradeoffs, say, between the Canadian and Dutch allocations?

Wolgast. I'm not sure the Canadian affiliates will come in and put all their political concerns and problems on the table. At the same time, whatever we do, we feel we're going to have to justify it to a lot of different governments around the world. So just because the Canadian government is screaming louder than anybody else, we don't necessarily feel we must give that affiliate its Imperial.

Student. I don't mean just screaming. I am talking about relative bargaining power to control Exxon's activities, or control what you do. My question is the organization one: how do you evaluate the concerns of the subsidiary from the corporate level? What kind of independent analysis do you do before you make the decision what needs to be done?

Wolgast. Well, we're trying to look at all of our concerns around the world. I can't say that any consuming country government has any more control over us than any other. In any country in which we operate, the government, as far as we're concerned, is all-powerful . . . they can do just about what they want to us.

Student. But some are more equal than others. The federal-state joint boards that make cost allocations in the telephone industry always seem to come out with a little bit more for California and New York, where there's a strong state regulatory body, than, say, Colorado or Massachusetts.

Wolgast. Well, you know, when I look at the U.K. government, the Canadian government, the French Government, the German Government, the U.S. Government, the Japanese Government — I think all those governments are pretty darn strong. As a company that is operating in those countries, I don't think we feel that any one of them is any stronger than another. Exxon has a lot more investment here; almost 50 percent of our profit comes from the U.S., so I suppose there's no question that as a company, our interests are more solidly in the U.S. than any other part of the world, and in the ultimate, I think, we've got to recognize that fact. But I don't know that we can say any one government is more powerful, is going to affect our interests more in Japan, or in other locations. They're all pretty strong, and in the ultimate, if they tell our affiliate it's got to do something, I guess it is going to do it.

Student. Does Exxon International have an in-house political analysis staff or office to talk about these kinds of problems?

Wolgast. We do, but we don't have an in-house staff that tries to analyze the political situation, say, in Canada. We rely on our Public Affairs Department in New York, which in turn relies to a significant extent on our affiliate in Canada. So most of our political analysis comes out of the various affiliates.

Student. I wonder if we can get back to Exxon's communications, particularly internal communications. Regardless of your regional bargaining, I assume that at some point there's a hierarchical problem that some key executive office body has to decide. How do you get information about what is going on into your "Politburo?"

Wolgast. Suppose there is a supply problem and the various regions of Exxon International are talking at the supply level and they can't agree, and then it goes up to where the chief executives of the regions then may come in, including the president of Exxon International. That has just happened recently, because one of the things we are trying to do right now for 1980 is decide how we are going to allocate the shortage that still exists within our company. For instance, right now we have about a 15 percent shortage of crude to meet demand. And if ARAMCO goes from the current production of 9 1/2 percent down to 8 1/2 percent, that shortage will rise above 20 percent. It's a real-time problem, and within the last couple of weeks all of the regional chief executives have been meeting with us, talking about what we should do, and we did not come to an agreement. What we're going to do is have another pass at that level. If we can't agree, we will bump the problem up another level to what we call our "inside board of directors", our management committee. At that level we have various directors responsible for each of the regions — one for Europe, another for Latin America — and those people will be informed of the various alternatives and some of their pros and cons. They're going to have to do the hard decision making.

Student. One of the things that has scared some people, with respect to military C³I, is the notion that the President of the United States might be on site at one of the unified or specified commands during a crisis, and would become the tool of, say, the Commander-in-Chief Europe, the Commander-in-Chief Pacific, or whatever. Suppose Exxon's executive committee was destroyed, and the only place to go home to was, say, a European region. Would you worry that thereafter corporate policy would be pretty much region-directed? Or does that question seem off-the-wall?

Wolgast. I think it does, because in our decision making we tend to have all our regions working together; and while they have different interests, we're trying to get them to understand what's in the total corporate interest, which is trying to be fair and equitable to the whole system.

Student. But that is what the National Security Act of 1947 says about the military, too. The question is, "In the event, what really happens?"

Wolgast. If in a crunch all New York disappears and our management committee happens to be over at London, they could come back to our U.S. operations in Houston, for

instance. I don't know if people have done as much "gaming" in Exxon as the military does along these lines. Right now, as far as decision making is concerned, I think each of our regions recognizes that on a worldwide basis we've got a very interdependent system. While they may meet and argue for more oil for their own area, when it comes right down to it I think they're cooperative, from the point of view of trying to be fair and equitable, in a total worldwide system. And most of the people involved in Esso Europe or Esso Eastern have done enough moving around in our circuit — they've had jobs in some of the other areas; I guess you could say the same thing about the military, but you can't really say it about the President — there has been a lot of interchanging, and I think they recognize each other's problems to a significant extent. So while each comes into the meetings and argues for his own position, and maybe argues points that are going to help that position, in the ultimate I think they do make decisions that try to be fair and equitable to the whole system.

Student. Are the affiliate heads in other parts of the world American nationals?

Wolgast. For the most part, yes. We have had one Venezuelan national on our management committee, and the number two man in our Far East affiliate in Houston is a Japanese national; he has been president of Esso Seikki. But for the most part the top people are American nationals. In Esso Europe we have sometimes had Europeans in relatively high levels, but most of the high-level Europeans are heading up their own operations, just as almost all our people in Esso France are Frenchmen and Germans in Esso Germany. There are very few Americans in France or in Germany, and I suppose 70 percent of the people in Esso Europe are Europeans, although the very top-level people are Americans. Almost all the people in the Esso Eastern headquarters group are Americans. It depends to a certain extent on the part of the world and how we've been able to develop managers, how successful we've been at moving nationals up into top levels of our organization.

Student. In cases of that sort, is devotion directed toward the United States, or the interests of the company?

Wolgast. That's certainly one of the questions I've been asked a number of times in news interviews and other forums. When I've talked about trying to share crude supplies equitably on a worldwide basis, people have asked me, "Aren't you an American, and don't you show favoritism towards the U.S.?" And my reaction is, yes, I feel I'm very much an American, and I feel we're an American company; but I feel it's also in the U.S. interest to share supplies equitably worldwide in a situation like this. Certainly the U.S. government has agreed to that kind of sharing in the International Energy Agency. And during this last year we in Exxon shared our supplies based on some sharing principles set out by the International Energy Agency and agreed on by all the major consuming countries in the world — that agreement is one of the reasons we use that basis, so we feel it is defensible.

Oettinger. In fairness to Pete here on the hot seat, it is, after all, U.S. policy to station troops in Europe and in Korea and Japan, so that what he has described is not inconsistent with the official government view of U.S. policy.

Wolgast. Now, how did we allocate in 1973-74? We determined our current and projected demands from the plan that was in effect prior to the embargo. We tried to establish a fair and equitable allocation of the available supplies, including "indigenous" U.S. production, and then we had to notify our affiliates and our third-party customers — our outside customers — of the restraints that had been put on us and tell them how we were allocating, how much they were going to be cut back, and that we were treating everybody, within the constraints we had, on the same basis. Adhering to the AOPEC embargo criteria, our maximum total reduction in production was 3.8 billion barrels a day less than in September '73 — a very significant cutback. We then redistributed the non-AOPEC crude — Iranian-type crude, for instance, and the increases amounting to 1.2 million barrels a day, that we got from other countries such as Iran, Venezuela, Indonesia and Nigeria, where production was increasing. Besides drawing on these countries we also drew on inventories, and we purchased and exchanged crude with other companies to increase some of our supply flexibility. For instance, we had made an exchange — I think it was with the Occidental Petroleum Company — in September 1973. They had taken some of our Saudi crude into Brazil. That meant a bigger allocation of Saudi crude for Brazil than we had requirements for, so that gave us an opportunity to trade with another company that might have needed to take some crude to Brazil and pick up something else in return that we could take to the U.S. or some other place. Our Logics system was very important in keeping track of all the constraints imposed on our system.

Student. To what extent were antitrust laws waived by the United States government to commit you to share data and supply information with the other major companies? Were special arrangements made by the Justice Department during the 1973 crisis to permit you to go beyond what is normally permitted?

Wolgast. I don't believe we sought waivers. The only time I can recall when we went to the U.S. government and asked, not really for a waiver of antitrust considerations but a letter of understanding, was the 1971-72 period when the industry was negotiating as a group with various AOPEC members, first about price increases and then, later on, about what they call "participation" (I'd call it "slow nationalization"). We had lawyers every time we got together, and we went down to the Justice Department and got clearance to operate as a group, because we were being taken apart one company at a time by the AOPEC governments, particularly Libya and Iran. We felt we had to negotiate as a group.

Student. Is it a fact that during the 1973 crisis each of the major oil companies made decisions of its own based on its own data and as each saw the world?

Wolgast. That is correct, but in saying that you have to recognize that in a company like ARAMCO, where there were four shareholders, each of us had to get together and scramble over or allocate the crude, because we knew, for instance, how much Saudi crude could go into France. The four of us had to get together and decide what was our fair share of that crude that was going into France, based on the way things had been split up.

Student. What are the limits to centralization of decision making and analysis in the company? From your New York headquarters you can keep track of all 137 ships, you can match supplies to demand; yet, on the other hand, you talk a great deal about affli-

ates coming into New York, sitting down and talking as colleagues. It would seem that you have the technological capability to put all these people right there in New York, and not have to go out to Singapore. Is it a political constraint? Is it a technological constraint? Why don't you just have a political office in Germany to deal with the German government and have all the data sent by submarine cable into New York?

Wolgast. It would be very difficult for us to, say, operate and make all of our decisions for Germany out of New York. There is the need to deal with people — the German government, and customers — and to make a lot of decisions right there on the scene, though we probably do make more basic decisions for Germany out of New York in a supply-constraint situation like this where we're having to allocate crude around the world, since we're probably affecting German operations more in times like this. But basically, the mind of management for our German operations is in Germany, and if we had to try to make those kinds of decisions out of New York, we'd make a lot of mistakes.

Student. Do you, then, feel a need for specific knowledge of the German psyche, or to be able to walk across the street and have lunch with somebody in Germany?

Wolgast. That's very important, to have good Germans operating — that is, they don't have to be Germans, they could be Americans on the spot — and a German affiliate who will have good relationships with people in the German government, with German customers, with a whole host of people in that particular country, so that they can work with them and understand and relate back what problems they are having in operating the company.

Student. But I take it your limit on decentralization, or autonomy, is on the "demand" side, in understanding where the world "demand" is coming from and how it is being articulated; whereas the "supply" or allocation side is, I take it, centralized to the international office in New York, and all the effective decisions as to supply, allocation and distribution are made by a guy who sits in the same building in New York. Or is this not the case?

Wolgast. Certainly, to a much more significant degree. The international worldwide coordination of 137 ships, 50 refineries and some 85 places for unloading crude, and about an equal number of places where we are picking up crude on an around-the-world basis, is done centrally. But let me distinguish between regions, which would be Europe as a whole, as compared with affiliates, which would be Esso Germany and Esso France. Esso Germany and Esso France report into Esso Europe in London, and in doing our supply coordination and our allocation we allocate to the regions. Esso Europe then allocates internally, itself, among affiliates. It has the autonomy to do that.

Student. You seem to be talking here about a crisis overlaid on a prior situation where market demands, and therefore fairly usefully structured national or regional factors, establish certain baseline patterns. So while in this crisis you had to invoke allocations, an important element in that was having reasonably recent credible baselines that had been evolved by a more free-floating market scheme. So that seems to reconcile a limited operation in New York working in this kind of pinch, allocating on the basis of what was

previously simply an operating scheme to react to the market, whose political legitimacy still rests on the fact that those shares, not too long ago, were determined by the market. It would seem to me, however, that if you move to a situation where shortages are, say, 50 percent, and the market memory becomes less of a legitimizing influence, then the question of where you need coordination becomes much more critical. It is not clear to me that in that case the scheme you are describing would necessarily work as well.

If that's a reasonable question, would you care to speculate about alternatives to that scheme? It seems to me that it is predicated on working on a short-term memory of satisfactory market allocations, but that the minute you are out of the short term your problems begin to worsen. I worry whether the system is structured now so as to be able to react satisfactorily to something that is even more acute or longer-term.

Wolgast. You know, we've been in a shortage situation now at Exxon for over a year. Initially we were doing it on a historical basis, but after a while we felt that that was inadequate because things had changed so much that we had to go over to forward planning. If we were now to go out with a new plan, we could run into games-playing, with affiliates coming in and deliberately putting in a high demand.

Student. Because you are now moving into an administrative rather than a bargaining situation?

Wolgast. Yes. So the longer we're in this allocation period the more difficult the situation gets, and that's one of the reasons we are running into more problems right now in 1980. For instance, what happens if you've got an affiliate with a new refinery coming onstream that wasn't in existence before? There's some more demand there. Would you make an exception in that case? A lot of different things can occur in this system that might tempt you to decide you ought to make an exception. But if you get too many exceptions then you've lost your planning stability.

Student. Does this mean increased centralization because you can't trust the data analysis or the development demand of an affiliate, because of the potential for games-playing? And does this lead to redundant analysis at the central office, to usurpation of the European region's authority to allocate crude as it sees fit? Are you seeing increased centralization?

Wolgast. I can't say it's increased centralization, since we've got all the regions coming in and trying to work with us. In the case of a problem — well, for instance, recently the U.S. government stepped in, took oil from us "majors", and allocated crude supplies for Ashland — for reasons we feel are very unfair and have been protesting. What happened was that Ashland picked up crude oil from the Arabian government in the second quarter of 1979, and that crude oil was available because the Iranian government had nationalized the companies that had been lifting oil in Iran. Exxon, which had been lifting about 45,000 barrels a day there, suddenly lost all that oil at the end of 1978. Other companies went in and picked it up — the Japanese were very aggressive — and some of the medium-sized American companies like Ashland went over and made new contracts. Then in November of 1979, when President Carter decided to stop importing Iranian oil, the Iranian government refused to let American companies move into any other place, and

canceled the contracts. Ashland lost about 80,000 barrels a day that they had been buying from the Iranian government. They then turned around and got an allocation from the U.S. government so that a company like Exxon, that had already lost 45,000 barrels a day, then had to provide supplies to Ashland. Ashland had made a corporate decision within the last two years to sell off their U.S. domestic production, because they decided it was more profitable to be refining and marketing and buying oil directly off the market, so they had exposed themselves to this kind of short-term shortage crisis situation. But in spite of that, partly because of political considerations, partly, I suppose, because the U.S. government practice was a fair way to act, the decision was made to allocate crude from the major oil companies to Ashland.

A similar situation happened with Union Oil Company. Union complained to the U.S. government that its supplies were about 10¢ a gallon more expensive than the average in this country, and that it should be allocated cheaper supplies from the major oil companies to make up the difference. Now Union had deliberately, for a number of years, made a corporate decision to do what I call "playing the spot market" — in other words, instead of making term supplies at somewhat stable prices, they were buying a lot of crude on a very short-term cargo-by-cargo basis at a time when there were excess supplies on the market. They were able to buy these crude supplies at prices below the term deals. So they were doing very nicely between 1976 and early 1978, when there were excess supplies on the market, but when things tightened up and there was a shortage the spot prices went way above the term prices and Union was caught short. They said they were uncompetitive, so they went and complained to the U.S. government, and the U.S. government took crude away from the "majors" to put Union in a better position.

Now Exxon had to decide what to do when this happened. First of all we protested, to no effect, to the U.S. government that this was unfair and unreasonable. But then we had to decide, because the U.S. government had taken crude away from us, whether we should pull crude in from our overall international pool, from Japan and Europe and other places, to help share, so that we could continue to keep the sharing mechanism. Or was this a special exception, so that crude had to come out of our Exxon-U.S.A. affiliate with no increases in foreign supplies for the Exxon-U.S.A. affiliate? We finally have decided we could not pull it in from other places, for a number of reasons. First of all, we felt we could not explain it to the Japanese government, and second, we thought if we did this, it would just encourage the U.S. government to take more such actions, because we'd draw more crude into the U.S. This was another of those worldwide decisions, with all the affiliates in trying to present their cases. Exxon U.S.A. was saying, "This is part of our demand and it ought to come out of the pool," and Esso Europe was saying, "That's impossible!" and giving us some of the reasons I've just given as to why we couldn't do it.

Student. I want to follow up on a question about antitrust legislation and intercompany cooperation. It would seem on the face of it that you would be able to work out a much more useful distribution in these times of stress by "majors" getting together and saying, "All right, you've got supplies we can send here to fill my market, and we've got supplies I can send there to fill your market, so let's work out a deal," and coming up with a much more rational system. Is that feasible? Is it legal?

Wolgast. I don't think there are any legal problems with it, and a certain amount of that kind of thing is done. We might do exchanges, for instance, if there were enough oil

around, and we might buy. Sometimes, when there is enough oil around, we may end up buying white low-sulfur crude from a company, selling them some heavier higher-sulfur grade of crude, and maybe paying a differential. Depending on the situation, there can be a fair amount of exchanging. Right now in Europe, in the last few months, because of some of our European requirements and our particular supply situation, we have exchanged some of our higher-sulfur — heavier, but lower-priced — Saudi Arabian crudes for some African crudes that some other companies have, and that we needed. And it made sense for us to make these kinds of exchanges. So at any point in time exchanges between companies are going on, based on quality or logistics. Not only internationally — it happens in the U.S. For instance, we have a refinery in Billings, Montana, most of whose gasoline is supplying the area around Billings, because no other company has a refinery out there. I don't know what the supply arrangements are, but we may be supplying gasoline to Texaco there, and Texaco is probably supplying gasoline around the refinery in another location, particularly in those relatively remote locations. If a company was going to try and come into such a location and bring their own supplies in, they could not be at all competitive with us, since we happen to have a refinery right there. Making a lot of such exchanges makes the marketplace more competitive; more companies can come in and be competitive if they can make exchanges. So there is no anti-trust reason why you cannot do this as long as the exchange is done in a competitive manner.