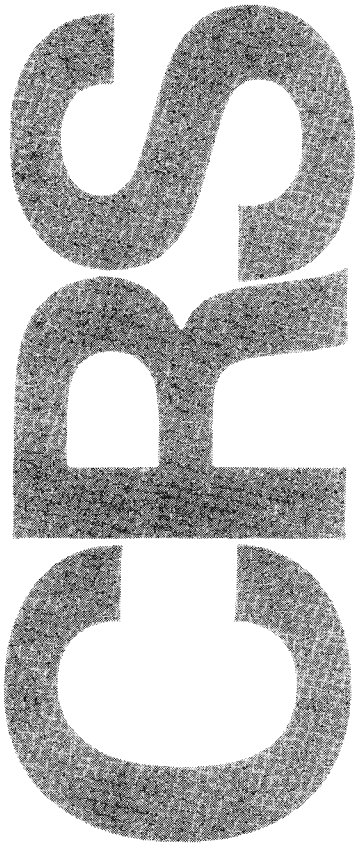
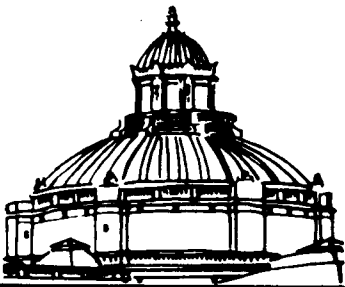


CRS REPORT FOR CONGRESS

DISRUPTION OF OIL SUPPLY FROM THE PERSIAN GULF:
NEAR-TERM U.S. VULNERABILITY
(WINTER 1987/88)



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ABSTRACT

The resumption of the tanker war during the summer of 1987 has renewed attention upon the diversification of crude oil transport in the Persian Gulf region. This report updates an earlier CRS study assessing the potential loss to U.S. and world markets from a widespread or total disruption of supply from the Persian Gulf in light of current and proposed expansion of crude oil pipeline capacity in that region.

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INTRODUCTION

When the tanker war in the Persian Gulf resumed during the summer of 1987, a reassessment of U.S. energy security was already underway. A study released by the Department of Energy in March 1987 and one issued the previous month by the National Petroleum Council had predicted that U.S. dependence upon insecure Persian Gulf oil supplies was likely to grow into the 1990s.¹ While that would not necessarily auger a future disruption, the most hopeful outlooks are always conditioned upon the instability of the Persian Gulf remaining in check.² But the renewal of the tanker war during the summer of 1987 has added a new shorter-term dimension to these worries, and has focused attention upon the diversification of crude oil transport in the Persian Gulf nations.

An earlier CRS report assessed the potential loss to markets from a widespread or total disruption of supply from the Persian Gulf (including the U.S. proportionate share from such an interruption), in light of pipeline expansions and capacity in the Middle East. It concluded that the U.S. would probably survive such an interruption with little difficulty.³

¹ See: U.S. Department of Energy. Energy Security. A Report to the President of the United States. March 1987. DOE/S-0057, and National Petroleum Council. Factors Affecting U.S. Oil and Gas Outlook. February 1987.

² See: U.S. Congressional Research Service. World Oil and the ANWR Potential. [by] Robert L. Bamberger and Carl E. Behrens. May 21, 1987. CRS Rept. No. 87-438.

³ See: U.S. Congressional Research Service. Disruption of Oil from the Persian Gulf: Near-Term U.S. Vulnerability. [by] Robert L. Bamberger with Clyde R. Mark. October 1, 1986. CRS Rept. No. 86-565.

This report updates that earlier study. While it is difficult to know whether U.S. energy security has appreciably grown or lessened in the past year, it has in all likelihood done neither. The general conclusion remains that the U.S. is poised to weather, at tolerable costs, the sort of oil interruptions likeliest to occur.

SUPPLY FOR EXPORT FROM THE MIDDLE EAST

To assess the consequences of an oil disruption, we assume that an escalation of the Iran-Iraq War and a further expansion of the attacks on tanker traffic result in a total interruption in tanker transport of crude oil through the Strait of Hormuz. We also assume initially that oil for export will continue to flow by pipeline overland through Saudi Arabia and Turkey.

Although figures on production from Persian Gulf producers are readily available, statistics on internal consumption by these nations are somewhat less current. Estimated oil consumption by Persian Gulf producers was 2.3 million barrels daily (mb/d) during 1986.⁴

Under the production quotas established by OPEC during the summer of 1986, production from the Persian Gulf membership of OPEC was to be 10.9 mb/d. However, OPEC production was widely reported to have crept significantly above production ceilings during the summer of 1987, with estimates of Persian Gulf nations' production at 12.43 mb/d.⁵ Assuming internal consumption currently

⁴ U.S. Central Intelligence Agency. Directorate of Intelligence. International Energy Statistical Review. August 25, 1987: p. 4. DI-IESR-87-008.

⁵ Petroleum Intelligence Weekly, August 10, 1987: p. 7. In late October, as this report went to press, PIW revised the July production figure to 12.35 mb/d while preliminary production estimates for Mideast OPEC during September were 12.6 mb/d. As these figures are all relatively close, the analysis in this report relies upon the September estimate.

at 2.3 mb/d, approximately 10.1-10.2 mb/d may be currently available for export by tanker and pipeline (see Table 1).

PIPELINE CAPACITY

Construction and expansion of pipelines in the Middle East has become the focus of wider inquiry since our initial study of this topic was completed in the fall of 1986.⁶ While pipeline capacity during the intervening year has increased modestly in line with most of our projections, it is less clear that this has reduced the strategic significance of the Strait of Hormuz or lessened vulnerability to a disruption. This is because the expansion of pipeline capacity during the last year has been offset by corresponding increases in Persian Gulf production and increased worldwide demand for oil. At the same time, production and consumption have fluctuated during the period due to shifting fundamentals that govern behavior in the market. It has been a difficult period to capture in a statistical "snapshot." A review of past and current developments may bring a revised analysis into better focus.

Shortly after the September 1980 beginning of the Iran-Iraq war, Iraq began sporadic attacks on Iranian oil facilities and tankers calling at Iranian ports. The pace of Iraqi attacks and Iranian retaliation increased in April 1984. Since mid-1984, there have been over 300 attacks against shipping in the Persian Gulf, about two-thirds of the attacks launched by Iraq.

One option available to Persian Gulf oil exporters to avoid endangering tankers and terminals is to utilize existing or construct new pipelines to carry export oil to ports outside the Gulf beyond the reach of Iranian and

⁶ See: U.S. Congressional research Service. Disruption of Oil from the Persian Gulf: Near-Term Vulnerability [by] Robert L. Bamberger with Clyde R. Mark. October 1, 1986.

TABLE 1
OPEC: PRODUCTION, INTERNAL CONSUMPTION, AND PRODUCTION CAPACITY

Mideast OPEC	Production July 1987 (000 b/d)	1986 Consumption (000 bbls/dy)	Implied Volume Avail- able for Export (000 b/d)	Capacity [2] (000 b/d)		
				Installed [3]	Maximum Sustainable [4]	Available [5]
Saudi Arabia	4,300.0	950.0	3,250.0	12,500.0	10,000.0	8,500.0
Iran	2,500.0	725.0	1,775.0	7,000.0	5,500.0	3,400.0
Iraq	2,100.0	280.0	1,820.0	4,000.0	3,500.0	2,000.0
Kuwait	1,200.0	120.0	1,080.0	2,900.0	2,000.0	1,950.0
UAE	1,395.0	130.0	1,265.0	2,550.0	2,415.0	1,550.0
Qatar	450.0	20.0	430.0	650.0	600.0	600.0
Neutral Zone	480.0	[6]	[7]	680.0	600.0	600.0
Total, Mideast OPEC	12,425.0	2,225.0	10,200.0	30,280.0	24,615.0	18,600.0
Other OPEC						
Venezuela	1,800.0	435.0	1,365.0	2,600.0	2,500.0	2,400.0
Nigeria	1,350.0	240.0	1,110.0	2,500.0	2,200.0	1,800.0
Libya	1,100.0	135.0	965.0	2,500.0	2,100.0	1,600.0
Indonesia	1,310.0	550.0	760.0	1,800.0	1,650.0	1,650.0
Algeria	670.0	155.0	515.0	1,200.0	900.0	900.0
Gabon	160.0	18.0	142.0	250.0	150.0	185.0
Ecuador	100.0 [8]	100.0	80.0	300.0	285.0	330.0
Total, Other OPEC	6,440.0	1,633.0	4,937.0	11,150.0	9,785.0	8,865.0
TOTAL OPEC	18,865.0	3,858.0	15,137.0	41,430.0	34,400.0	27,465.0

[1] Petroleum Intelligence Weekly

[2] Central Intelligence Agency

[3] Installed capacity includes all aspects of crude oil production, processing, transportation, and storage. Installed capacity is generally the highest capacity estimate.

[4] Maximum sustainable or operational capacity is the maximum production rate that can be sustained for several months; it considers the experience of operating the total system and is generally some 90-95 percent of installed capacity. This capacity concept does not necessarily reflect the maximum production rate sustainable without damage to the fields.

[5] Available or allowable capacity reflects production ceilings announced by individual members. Iraqi capacity is limited by restrictions placed on exports as a result of the Iraq-Iran war and the closure of the Iraq-Syria pipeline.

[6] Neutral Zone consumption is shared between Saudi Arabia and Kuwait.

[7] Reflected in numbers above.

[8] Ecuador's production has fluctuated during 1986 between 40,000-240,000 b/d. January-August volume has averaged 106,000 b/d (PIW), with 1986 exports estimated by the CIA at 79,000 b/d and internal consumption estimated at 100,000 b/d. We therefore have assumed production at 100,000 b/d, internal consumption at 100,000 b/d, and implied volume available for export at 80,000 b/d.

Iraqi military forces. Many believe that the use of existing pipelines and the construction of new pipelines will diminish but not eliminate the strategic importance of the Strait of Hormuz for exporting oil from the Persian Gulf littoral.

But pipelines are not a flawless remedy; pipelines are expensive, take time to build, demand trained technicians and specialized equipment and machinery. Additionally, their static location makes them more vulnerable to attack and sabotage than ships if the Iraq-Iran war, or any other conflict, should expand beyond the Persian Gulf.

If existing, operating pipelines connecting Persian Gulf oil producing regions to ports outside of the Persian Gulf were operated at full capacity, between 4.5 and 4.8 million barrels per day (mb/d) could be exported from the region without traveling waterborne through the Strait of Hormuz. (See table 2)

In 1986, Gulf states exported about 9.7 mb/d (production of 12 mb/d minus consumption of 2.3 mb/d),⁷ and we estimate that net exports were theoretically near 10.1-10.2 mb/d during the late summer of 1987. However, existing pipelines have not been operating at full capacity during this period, and it is difficult to estimate what the actual throughput has been.

Petroline, which runs from Saudi Arabia's eastern oil fields to the Red Sea, was expanded from 1.9 mb/d up to about 3 mb/d in the summer of 1987, but the new pipeline is still undergoing testing. Even before the expansion, the line was carrying 1 to 1.1 mb/d, one half of which was Iraqi crude oil. The Iraqi line through Turkey appears to be running under its 1.5 to 1.6 mb/d capacity. August 1987 volume was estimated at 1.3 mb/d.⁸

⁷ Central Intelligence Agency. Directorate of Intelligence . International Energy Statistical Review. DI-IESR-87-008 Z5 August 1987.

⁸ Petroleum Intelligence Weekly, Sept. 14, 1987: p. 7.

Existing Non-Operational Pipelines

If existing but non-operational lines were rebuilt and restored to full capacity, another 2.4 to 2.7 mb/d pipeline capacity would be available to export oil and bypass Hormuz. But it is unlikely that the full unused capacity could be restored. Saudi Arabia's TAPline (500,000 b/d) would need extensive repairs after ten years of disuse and damage from the 1975-1976 Lebanon civil war and the 1982 Israeli invasion of south Lebanon, and would need difficult economic and political agreements to cross Jordanian, Syrian, and Lebanese territory. The segment that passes through Syria's Golan Heights is occupied by Israel, and south Lebanon is a combat zone for several militias and governments.

Iraq's IPC lines (1.2 to 1.5 mb/d) pass through Syria, but Syria and Iraq are adversaries, and one of the two Mediterranean terminals is in Lebanon, also subject to the vagaries of Lebanon's civil strife. Only the IGAT-1 natural gas line from Iran to the Soviet Union appears readily operational, but depends upon converting the gas line to a crude line and an agreement between Iran and the Soviet Union.

Proposed Pipelines

Completing all the pipelines currently on the drawing board would add another 5.2 to 5.7 mb/d capacity, but it is highly unlikely that all the proposed lines will be built.⁹ For example, if Iraq restored its existing lines and built its proposed lines, Iraq would be able to export 5.4 to 5.8 mb/d. Iraq is producing only 2.2 mb/d at present, has never produced more than 3.5 mb/d (in 1979), and has installed production capacity of only 4 mb/d. Obviously, Iraq would not build more pipeline capacity than it needed. But there are current reports that Iraq signed contracts with a consortium in late September 1987 for construction of the IPSA-2 line. However, we do note that there have been similar reports in the past that the project was about to be commenced--only for these plans to founder.¹⁰

⁹ Iran, Iraq, and the Gulf Cooperation Council have proposed a number of pipeline additions and expansions. These include IPSA-2, which Iraq would build to connect with IPSA-1 at pumping station #3 of the Saudi Petroline, and then run some 600 miles to an Iraqi-built terminal 12 miles south of Yanbu on the Saudi Red Sea coast. Iran recently announced discussions with Soviet technical teams about converting a natural gas pipeline which runs to the Caspian Sea into a 700,000 b/d crude oil carrier. For a complete summary and discussion of proposed pipelines, please see the appendix at the end of this report.

¹⁰ The latest reports are from the Christian Science Monitor, Sept. 21, 1987: p 2, and Oil Daily, September 22, 1987. The pipeline is to be built by Japanese, Italian, French and South Korean firms. Iraqi Oil Minister Abdul-Rahim Al-Chalabi was quoted that the expansion would boost Iraqi exports to more than 3.0 mb/d within two years.

Table 2

Persian Gulf Oil Pipelines
Available and Proposed Capacities
(million barrels per day)

Country/Line	Currently Available Capacity	Available but Closed	Proposed or Under Construction	Total Capacity Available if Proposed Lines Completed
Saudi Arabia				
Petroline	3.0-3.2			
TAPline		.5		
Saudi Total	3.0-3.2 ¹¹	.5		3.5-3.7
Iraq				
Iraq-Turkey	1.5-1.6			
IPSA-1	.5 ¹¹			
Strategic	(1.0) ¹²			
IPC		1.2-1.5		
IPSA-2			1.65	
Aqaba			1.0	
Iraq Total	2.0-2.1	1.2-1.5	2.65	5.35-5.75 ¹³
Iran				
IGAT-1		.7		
Gurreh-Asaluyeh			(1.5) ¹⁴	
Shiraz-Jask			1.0-1.5	
Turkey			1.5	
Iran Total	0	.7	2.5-3.0	3.2-3.7
Gulf Cooperation Council (GCC)				
Kuwait-Fujayrah/Salalah			?	
Kuwait-Petroline			?	
GCC Total	0	0	?	?
Persian Gulf Total	4.5-4.8 ¹¹	2.4-2.7	5.15-5.65	12.05-13.15

¹¹ At present, IPSA-1 Iraq can carry about 500,000 b/d to Petroline and is included in the Petroline total.

¹² The strategic pipeline carries oil north and south within Iraq and is not included in the pipeline export total.

¹³ Total does not include IPSA-1, which is included in the IPSA-2 total.

¹⁴ Asaluyeh is inside the Persian Gulf (inside the Strait of Hormuz) and is not counted as an export pipeline.

Sources: International Petroleum Encyclopedia, Europa Yearbook for Middle East and North Africa, Petroleum Intelligence Weekly, Petroleum Economist, Middle East Economic Digest.

THE PICTURE THAT BEGINS TO EMERGE

Assuming petroleum consumption by Persian Gulf countries at 2.3 mb/d and production hovering at August 1987 estimates of 12.43 mb/d, roughly 10.1 mb/d of crude is available for export. Assuming full utilization of currently available pipeline capacity (4.5-4.8 mb/d) for export purposes, were there a total disruption of tanker traffic, the loss to world oil markets from the Gulf potentially would range from 5.3 to 5.6 mb/d. Were the disruption to occur after construction of IPSA-2 and utilization of its projected capacity, the loss of supply might be 3.7-4.0 mb/d.¹⁵

Potential Production Outside the Gulf

How much of this loss to the world oil market could be offset by production elsewhere? OPEC nations outside the Persian Gulf are technically committed to production ceilings adopted in 1986 of slightly more than 6 million b/d, though their production was estimated at more than 6.1 mb/d at yearend, and slightly more than 6.4 mb/d in August 1987.¹⁶ Maximum sustainable production for these OPEC nations is variously estimated to range from 8.8-9.8 mb/d.¹⁷ This estimate suggests potential additions to supply

¹⁵ IPSA-2 will have a capacity of 1.6 mb/d, of which 500,000 b/d will presumably be the approximate volume that Iraq presently sends via IPSA-1 to Petrolina. The completion of IPSA-2 will free up that capacity in Petrolina and the Saudis could choose to boost their own throughput accordingly. Hence, our calculations assume that the completion of IPSA-2 will indeed mean a potential addition to pipeline throughput of 1.6 mb/d rather than just the 1.1 net addition for Iraq.

¹⁶ Petroleum Intelligence Weekly, Aug. 10, 1987: p. 7.

¹⁷ Depending upon source. Two are: Central Intelligence Agency. International Energy Statistical Review. Aug. 25, 1987: p. 4, and a study by Copeland, Wickersham, Wiley and Company. Issue Paper. The Persian Gulf: A discussion of Alternative Sources of Supply in the Event of a Disruption in

from OPEC nations outside the Gulf in a range of 2.4-3.4 mb/d. This figure reflects roughly 500,000 b/d in potential additional production from Libya, the assumption being that Libya would succumb, in this scenario, to economic self-interest.

Arriving at a dependable estimate of excess capacity dispersed among non-OPEC producers is more difficult. Entering the fall of 1987, we continue to estimate potential additions to world supply from non-OPEC sources at 900,000 b/d.¹⁸

Little can be said about additional capacity in China and Russia, nor can the response of these nations to extraordinary market developments arising out of an escalation of the Gulf war be reliably predicted. We therefore do not include these nations in our calculations. Thus, we estimate unutilized crude capacity worldwide to be in the vicinity of 3.3-4.3 mb/d.

Three scenarios present themselves. If we assume that an escalation of the tanker war should happen before pipeline expansions are completed, and that other nations are, for any variety of reasons, unable or unwilling to offset lost production, we could reasonably expect a shortfall in world crude supply of 5.6 mb/d or more. A shortfall of this magnitude would represent 12-13 percent of free world oil production.¹⁹

the Strait of Hormuz. June 25, 1987: see Table 4.

¹⁸ Non-OPEC nations believed to have surplus capacity of at least 100,000-200,000 b/d are Mexico, Malaysia and Norway. Other non-OPEC oil producers have less. For a complete listing, see Copeland, op. cit. Table 4.

¹⁹ Petroleum production by non-Communist countries in July 1987 was reported at 45.3 mb/d. Petroleum Intelligence Weekly. Aug. 10, 1987: p. 7.

If both OPEC and non-OPEC producers choose instead to produce at maximum sustainable levels and current pipelines are used to capacity, the net shortfall would decline to approximately 1.3-2.3 mb/d. A net shortfall in world supply of this magnitude would represent a loss to markets of 3-5 percent of free world oil production during mid-summer 1987.²⁰

If we assume utilization of existing pipelines as well as a completed IPSA-2--and utilization of surplus capacity worldwide--the total potential shortfall ranges between no shortage at all and roughly 700,000 b/d.

We should note that the first, and bleakest scenario assumes that OPEC production continues at levels in excess of assigned quotas, and that demand really supports this level of OPEC production. Both assumptions are debatable. There were reports in late September that OPEC quota violations were being "exaggerated" in some quarters, and that collective output was likely to be cut. The summer is also a traditional time for building stocks.²¹

Because most nations outside the Gulf would probably welcome a chance to market additional volumes of oil, the probability of a 5.6 mb/d shortfall is highly unlikely. The worldwide consequences of such a shortfall, were it to occur, are more difficult to predict, but would probably not be serious. Our scenario assumes that a cessation of tanker traffic in the Gulf--whether through blockade of the Strait or a shooting war that discourages tanker

²⁰ Petroleum Intelligence Weekly, Aug. 10, 1987: p. 7.

²¹ See stories in Oil Daily: "OPEC Quota Violations Said to be 'Exaggerated,'" September 23, 1987, and "OPEC Reducing Crude Oil Output, Subroto Claims," September 24, 1987. See also: "OPEC September Output Dips," Oil Daily, October 6, 1987.

traffic--would be rather brief and surely not last more than six months. Petroleum exports are so critical to the economies of the Persian Gulf countries that it seems unlikely that non-warring petroleum-exporting nations would tolerate for long an interruption in oil commerce without inviting or initiating political or military intervention and resolution.

In the meantime, worldwide stocks would very likely prove adequate until some resolution of the disruption was achieved. Rules of the International Energy Agency (IEA) call for nations to maintain stocks equal to 90 days of the previous year's net imports. Current stocks among the IEA nations as of summer 1987 were estimated at 157 days of net imports, with 100 days deemed accessible in the short term.²² The IEA estimates that worldwide stocks would cover a 2 mb/d shortage for over two years, though it considers it unlikely that an interruption would last more than a few months.²³

It is beyond the scope of this report to estimate the price effects of these various losses of oil to world markets. During some shortages, the price for crude has spiked upwards seemingly out of proportion to the modest volumes of crude that were lost to the world market. Under the bleakest of the scenarios developed here, it seems unlikely that prices would, even in the short-term, exceed \$30/bbl. But given past experience, the possibility that prices might peak higher should not be entirely discounted. The

²² Petroleum Intelligence Weekly, August 10, 1987: p. 3-4. The Saudis have sold much of their "floating stockpile," estimated in the spring of 1987 at 40 million barrels. It is now believed to be roughly 20 million barrels. See; Petroleum Intelligence Weekly, September 21, 1987: p. 8.

²³ Ibid. The IEA has presently under review a draft manual for coping with a "sub-crisis" of a magnitude consistent with the likelier scenarios outlined in this report. These measures will be tested in early 1988.

important point to note, though, is that while a price spike to the range of \$30-\$35/bbl would represent a significant percentage increase from the predisruption price, it is a price range which the world has visited before, and would not seem likely to generate effective pressure for market-interventionist policies or concerted action on the part of the International Energy Agency (IEA).

U.S. Proportionate Share of Shortage Volume

As has been observed in earlier disruption studies, all major importers are affected by a shortfall in supply, regardless of their relative dependence upon imported petroleum.²⁴ World oil production constitutes a pool, and when the size of that pool diminishes during a supply interruption, supply is re-allocated as purchasers bid for the available supply. The United States presumably would suffer a proportionate loss of its oil imports. A short- or mid-term loss of 1.0-2.3 mb/d in today's markets might prompt a short-term increase in price, but if it were anticipated or apparent that spare production capacity was coming on-line, or stockpiles to be drawn upon, prices would be likely to drift back towards their pre-disruption levels.

Were a loss of 0.7-5.6 mb/d in world supply shared proportionately among OECD importers, the United States would suffer a loss in supply between 240,000-1,900,000 b/d.²⁵ A loss of supply of these magnitudes would

²⁴ See, for example: U.S. Library of Congress. Congressional Research Service. Oil Supply Disruptions and the U.S. Economy: Autumn 1984. August 1984. Report No. 84-142 S: p. 11-14.

²⁵ This calculation assumes that the U.S. shares a proportionate loss in net imports among OECD countries. In 1986, total OECD imports have been reported at 18.2 mb/d, and the U.S. share of that was 6.061 mb/d. U.S. imports during the first seven months of 1987 have averaged slightly higher, 6.2 mb/d. See: Central Intelligence Agency. International Energy

represent 1.5-12 percent of average petroleum products supplied during the first three quarters of 1987.²⁶

While a loss of 12 percent is not trifling, it is nonetheless an amount that could be offset for several months by distribution from the Strategic Petroleum Reserve. Indeed, the relative energy security of the United States under current market conditions is largely owed to the current size of the Reserve.

QUESTIONS LEFT TO PONDER: CAUSE FOR ALARM?

This report, when first prepared in October of 1986, concluded that the U.S. was poised to weather the sort of oil interruptions likeliest to occur, if at all. A year's time has not altered that fundamental conclusion. However, because levels of production and consumption have been fluctuating in recent months, it is difficult to know whether U.S. energy security has appreciably grown or lessened in the past year. In all likelihood, it has done neither. The recently completed pipeline expansions have been offset by increases in OPEC production, but it is not apparent that the growth in OPEC output during the summer of 1987 is more than a short-term phenomenon.

It also continues to appear that the severity of the scenarios would have to worsen well beyond the range of likelihood before the shortfall would boost world prices to levels that governments or policymakers would find unacceptable--or before the pro-rata U.S. share of the shortage would

Statistical Review. Aug. 25, 1987: p. 4. and: DOE, Monthly Energy Review, May 1987: p. 37.

exceed the ability of the Strategic Petroleum Reserve to comfortably absorb it.²⁷

At current levels, the SPR affords virtually 90 days of protection if all crude and petroleum product imports to the U.S. ceased. But, under the more likely shortage scenarios described here, the SPR would provide protection to the civilian sector for a period ranging from seven months to more than a few years. If the disruption is accompanied by military involvements that increase Defense Department requirements, the potential protection to civilian markets afforded by the Reserve may be diminished. But it seems unlikely that a situation that seriously threatened worldwide oil supply and economies would be allowed to persist anywhere near the limit of IEA stocks.

As the capacity of Mideast crude oil pipelines and their strategic importance increases, these may become equally attractive targets of sabotage or direct attack as waterborne traffic or the Strait of Hormuz itself. However, these attacks would have to be both sustained and systematic to effect a lengthy and deep reduction in available world supplies. It also seems unlikely that marauding planes on such a mission would easily penetrate Saudi airspace, or that a nation would, without serious forethought, mount such an attack on Turkey, which is a member of NATO and a neutral in the Iran-Iraq War. Nonetheless, some loss of pipeline capacity due to an expansion of the Gulf War should not be altogether eliminated as a possibility.

²⁷ By October 1987, the Strategic Petroleum Reserve held more than 533 million barrels of crude.

Are there policy implications? In its report on energy security issued in March 1987, the Administration expressed mindfulness that U.S. dependence on insecure oil supplies was likely to increase into the 1990s, but that on balance, there was no demonstrable reason for any pre-emptive intervention in markets. Instead, the Administration took the position that the situation bears careful monitoring while continuing to rely maximally on the market to price and allocate fuels.²⁸

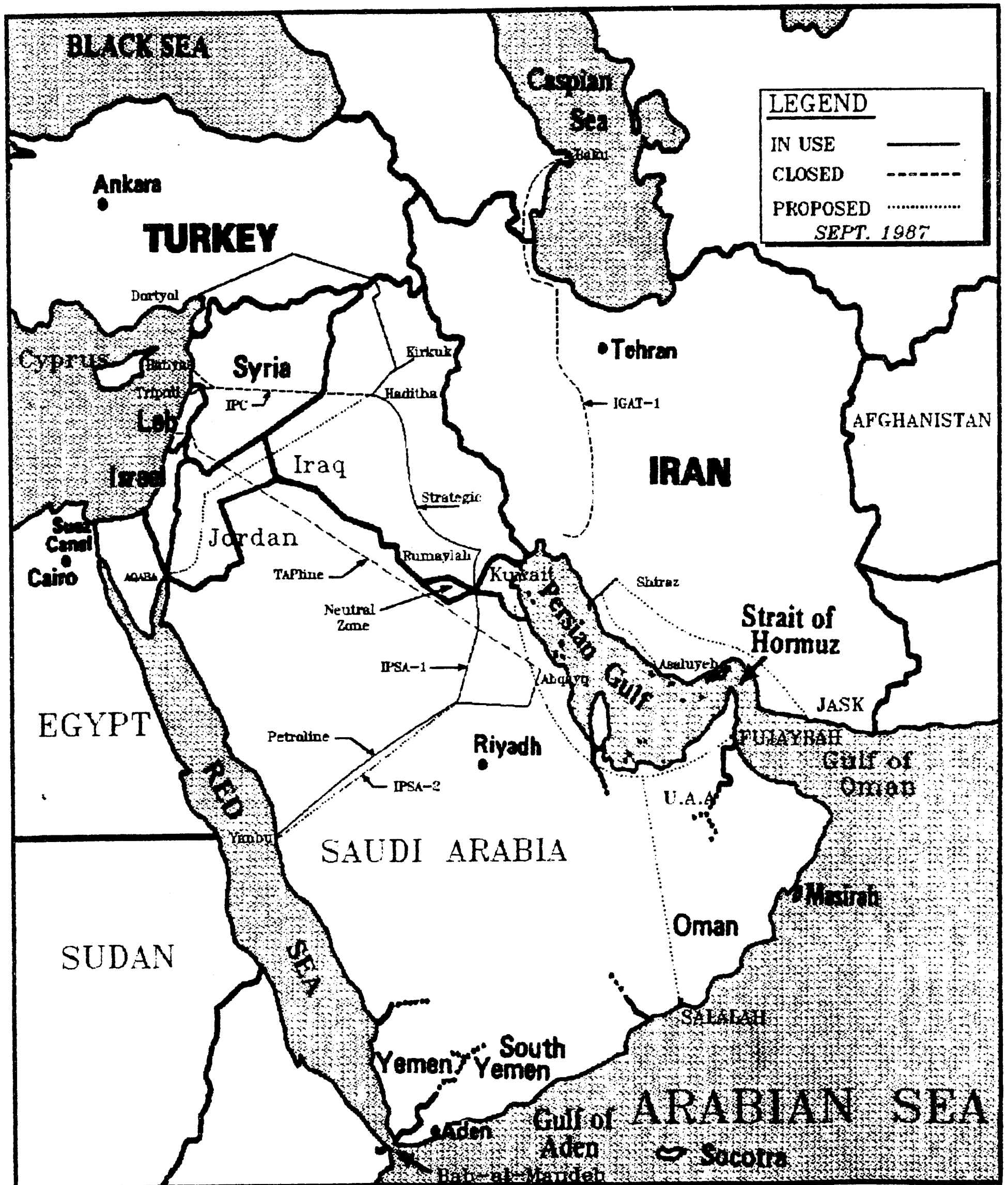
The Administration continues to adhere to this outlook. Testifying before the Senate Committee on Energy and Natural Resources in May 1987, William F. Martin, Deputy Secretary of the Department of Energy, acknowledged that if low oil prices persisted, U.S. oil imports could reach 50 percent of projected national consumption by 1992 and 60 percent by 1995.²⁹

However, given the uncertainty of these projections, the Administration's position continues to be that market forces should be allowed to operate unimpeded, and that the response of the United States to the prospect of renewed dependence upon insecure oil supplies should be to "seek adequate energy security at reasonable cost," a strategy which includes: [a] continued development worldwide of strategic stockpiles; [b] encouraging diversification from insecure sources for crude, and utilization of alternate fuels, such as coal; [c] adoption of tax and other policies at both Federal

²⁸ U.S. Department of Energy. Energy Security. A Report to the President. March 1987. DOE/S-0057. In June 1987, the President sent a number of recommendations to Congress pursuant to the study, but they were modest in scale, including support for fill of the SPR, repeal of the Windfall Profits Tax, and fairly minor technical amendments to existing law.

²⁹ See: U.S. Congress. Senate Committee on Energy and Natural Resources. Energy Security. May 20, 1987: p. 15-16.

PERSIAN GULF – OIL PIPELINES



and State levels which will relieve the burden on the domestic oil industry; and to [d] foster international cooperation.³⁰

Just as when, in 1985, there were calls for action by the Federal Government to protect the domestic production and refining industries from a contraction, the response by the Administration in this instance, too, has been to regard the situation as one whose consequences bear monitoring, but which is not necessarily reflective of deep, systemic ills that require massive preventive or curative therapies.³¹

Clearly, the course of lower oil prices and their consequence is far from played out. The Congress joins the Administration in monitoring the situation, reserving the prerogative to make its own assessment and response to developments in U.S. energy security.

³⁰ See prepared testimony of William F. Martin, Deputy Secretary, Department of Energy, before the Senate Committee on Energy and Natural Resources, September 18, 1986, p. 1, 11, 13; and testimony of Alan P. Larson, Deputy Assistant Secretary (Designate) for International Energy and Resources Policy, Department of State. September 18, 1986: p. 8. See also testimony of William Martin in hearings of May 20, 1987 op. cit., p. 41.

³¹ As it turned out, the reported net loss to the domestic refining industry in 1985 was only 68,000 b/d. This was the net of a loss of 240,000 b/d in shutdowns, offset by additions of 175,000 b/d from new or reactivated units. See a summary in: National Petroleum News, August 1986: p. 34.

APPENDIX - PIPELINES IN THE PERSIAN GULF

Saudi ArabiaAvailable Lines

1. Petroline (also called East-/West Line)

The 1270 kilometer/790 mile Petroline from Abqayq in the eastern Saudi Arabian oil fields to the Red Sea port and petrochemical complex at Yanbu was authorized in 1977, completed in 1981, at a cost of \$1.6 billion, and fully operational in 1983.³² Until early September 1987, the 48 inch, 1.86 million barrel per day (mb/d) capacity line was carrying only 1 mb/d, one third to one half of which was Iraqi crude from the IPSA-1 line (see below), and the rest Saudi crude. In August 1987, a second, 56 inch, line brought the total capacity up to 3 or 3.2 mb/d, but the new line was expected to undergo testing for several months. Paralleling the two crude lines is a 26/30 inch gas liquids line that fuels Petroline's 11 pumping stations and the Yanbu industrial complex. All three lines are owned by the Saudi state company Petromin. Petroline crude is exported from Yanbu or feeds two refineries (420,000 b/d capacity, jointly owned by Petromin and Mobil Oil).

³² Much of the information about existing and proposed pipelines discussed here came from: Al-Tikriti, Abd al-Ilah, The Importance of Pipeline Networks in the Arab Oil Industry, Al-Naft wa al-Taawun al-Arabi, Kuwait, vol. 12, no. 1, 1986: 94-111; reprinted in Joint Publications Research Service, 9 October 1986 (JPRS-NEA-86-129), p. 1-14. Other general information about Persian Gulf pipelines may be found in the International Petroleum Encyclopedia, the Europa Yearbook for Middle East and North Africa, OPEC Annual Statistics, or by following events in any one of the several trade publications, such as Petroleum Economist, Petroleum Intelligence Weekly, Oil and Gas Journal, Middle East Economic Digest, or Middle East Economic Survey.

2. TAPline (partially used)

The TransArabian Pipeline (TAPline) has two segments, a 500 kilometer/310 mile line from Abqayq to Qaysumah, owned by Petromin, and a 1200 kilometer/745 mile line from Qaysumah to al-Zahrani, Lebanon, owned by Aramco. The line, completed in 1950, carried between 480,000 and 500,000 b/d until it was closed in 1975 because of transit fees to Jordan, Syria, and Lebanon made the line uneconomic. Additionally, TAPline's operation and maintenance is complicated by the 1967 Arab-Israeli war in which Israel seized and occupied Syria's Golan Heights, across which TAPline passes, by the Lebanese civil war 1975-1976, and by the Israeli invasion of south Lebanon in 1982, which damaged the line and terminal. At present, TAPline carries some 60,000 b/d of Saudi crude to the Jordan Petroleum Company refinery at al-Zarqa. TAPline would need extensive repairs and maintenance, and political accommodation, before it could be restored to full use.

Iraq

Available Lines

1. Iraq-Turkey

A 1005 kilometer/624 mile, 500,000 b/d pipeline from the northern Iraqi oil fields at Kirkuk to the terminal at Dortyol, Turkey, was completed in 1978. In 1984-1985, the line was expanded to about 1 mb/d and a parallel pipeline added another 600,000 b/d in August 1987,³³ for a total present capacity of 1.5 to 1.6 mb/d. In the first half of 1987, before the second line was completed, the Iraq-Turkey line was operating at or near its 1 mb/d

³³ The new pipeline was inaugurated on 19 August 1987. Ankara radio, Foreign Broadcast Information Service (FBIS), 19 August 1987.

capacity. The Iraqi segment is owned by the state company, the Iraq National Oil Company, and the Turkish section is owned by the Turk company Botas, which is 51% state and 49% private.

2. IPSA-1

The Iraq Pipeline to Saudi Arabia (IPSA-1) runs 558 kilometers/347 miles from the southern Rumaylah-al-Zubayr oil fields south through the Iraq-Kuwait-Saudi neutral zone into Saudi Arabia to connect with Petroline at pumping station #3. Iraq began the 48 inch, 500,000 b/d line in 1984, and completed it in October 1985. Apparently, IPSA-1 has not been used to capacity, carrying between 300,000 and 400,000 b/d into Petroline and on to Yanbu.³⁴ Future plans call for IPSA-1 to be disconnected from Petroline and connected to IPSA-2, which will carry Iraqi crude to a terminal 12 miles south of Yanbu. (See below under proposed lines.)

3. Strategic Line (also called the North-South Line)

In 1976, Iraq completed the 680 kilometer/422 mile, 42 inch, 1 mb/d line from the southern Rumaylah and al-Zubayr fields to the Hadithah (or "K3") pumping station on the now unused IPC lines. The Strategic Line is reversible, allowing Iraq to direct southern oil north for export through Turkey, or Kirkuk oil south for export through IPSA-1 and Saudi Arabia (or to the war damaged lines to the Faw peninsula and the two offshore loading terminals at Mina al-Bakr and Khawr al-Amaya, which could be rebuilt of and when the Iran-Iraq war ends).

³⁴ McNaugher, Thomas L. Pipelines and Power in the Gulf: Shifting Balances. Cambridge Energy Research Associates, December 1986.

4. IPC Lines (unused)

Four pipelines of 12, 16, 28/30, and 30/32 inches run 890 kilometers/550 miles from Iraq's northern fields at Kirkuk to the Mediterranean ports at Banyas, Syria, and Tripoli, Lebanon, with a total capacity of between 1.2 and 1.5 mb/d. Iraq closed the IPC lines in 1976, over a transit fee dispute with Syria. Syria and Iraq agreed to revised fees in December 1981, after Iraq's Persian Gulf terminals were destroyed by Iran in the Iran-Iraq war, but the lines carried only about 350,000 b/d. Syria closed the lines in April 1982, because of Iraqi-Syrian disagreements over Syria's support for Iran. The IPC lines could be reopened within a brief period of time with only moderate repairs and maintenance, but the political agreement between Syria and Iraq is more problematical.

Proposed Lines

1. IPSA-2

IPSA-2 will connect with IPSA-1 at pumping station #3 of the Saudi Petroline, and run 969 kilometers/602 miles to an Iraqi-built terminal 12 miles south of Yanbu on the Saudi Red Sea coast. Total capacity of the IPSA-1/IPSA-2 line will be 1.65 mb/d. The \$1.5 billion IPSA-2 project (line and terminal) is scheduled for completion in late 1988 or early 1989, but progress on the actual construction is uncertain.

2. Aqaba Line

The proposed Aqaba line would run from the IPC Strategic pumping station at Hadithah to the Jordanian city of Aqaba on the Gulf of Aqaba-Red Sea. The 800 kilometer/500 mile line would carry 1 mb/d, with a spur line to feed the

Jordanian refinery at al-Zarqa. Plans for the \$1 billion Aqaba line emerged in 1984, but little has been done on the project since then.

Iran

Available Lines

1. IGAT-1 (unused)

The 40/42 inch IGAT-1 natural gas pipeline from Agha Jari and Gach Saran in west-central Iran to Baku, the Soviet oil center on the Caspian Sea, was completed in 1970, but closed in 1979, over a price dispute. The Iranian Government announced in August 1987, that Soviet and Iranian technical teams were meeting to discuss converting the 1,000 kilometer/600 mile natural gas line to a 700,000 b/d crude carrier. The Iranians claim the conversion could be completed within three months.³⁵ At present, the line supplies natural gas from the southern fields to the capital at Teheran.

Proposed Lines

1. Gurreh to Asaluyeh

According to some reports, Iran began construction of a 380 kilometer/236 mile, 1.5 mb/d pipeline from Gurreh, a pumping station feeding the Kharg Island terminal, south along the Persian Gulf coast to Asaluyeh. The \$2 billion project supposedly will be completed in 1988. A terminal at Asaluyeh would halve the distance tankers must travel between the Strait of Hormuz and Kharg, and reduce their vulnerability to Iraqi air attacks.³⁶

³⁵ Middle East Economic Digest, 22 August 1987; Teheran radio, FBIS, 8 September 1987.

³⁶ McNaugher, op. cit.

2. Shiraz to Jask

Iran proposed to build a 1200 kilometer/745 mile crude oil pipeline from Shiraz to Jask, a small port outside the Strait of Hormuz, to circumvent the Strait and possible attacks inside the Gulf. The line, reported to be under construction and due for completion in 1988,³⁷ would carry between 1 and 1.5 mb/d. Shiraz is linked to Gach Saran oil and gas fields, and presumably that line would connect with the line to Jask.

3. Turkey Line

In the summer of 1986, Iranian and Turkish officials discussed a 1.5 mb/d line from northern Iran through Turkey to the Mediterranean port at Iskandirun. No progress has been reported on planning or construction.

Gulf Cooperation Council

Proposed

1. Kuwait to Fujayrah/Oman

One proposal, intended to circumvent the Strait of Hormuz, is to construct a line from Kuwait either to Fujayrah, just outside the entrance to the Strait of Hormuz, or to Salalah, Oman. The Kuwait-Fujayrah line would be about 775 kilometers/480 miles long, and the Kuwait-Salalah line would be about 900 kilometers/560 miles long. It is assumed that Kuwait, Qatar, and the United Arab Emirates would have access to the line, and that Saudi Arabia and Bahrain would not need the line because of Petroline. Omani oil is piped to Gulf of Oman ports now, and does not pass the Strait of Hormuz.

³⁷ Agence France Presse, FIS, 29 June 1987; Le Monde, 20 August 1987.

2. Kuwait-Petroline

One suggestion offered by observers is that Kuwait build a spur line similar to the Iraqi IPSA-1 to connect with the Saudi Petroline and ship Kuwaiti oil out through Yanbu on the Red Sea. It is not known if the suggestion is being given serious consideration or if formal planning is taking place.