June 9, 1987
10:30 a.m., as discussed by phone

To: Vicki Masterman
Domestic Policy Council

From: Jackee Schafer
Council on Environmental Quality

Jackee -3742

Re: Comments on DPC's 6/8/87 draft on Stratospheric Ozone

On page 6, under "B. AN EMISSIONS CONTROL PROTOCOL", amend the paragraph that introduces the series of questions pertaining to the emissions reductions beyond a freeze as follows:

"....or be tied to future scientific, technological, economic and environmental ("STEE") assessments. Article III of the Chairman's text provides for the first assessment in 1990, and every four years thereafter, i.e., in 1994, 1998, etc.."

DISCUSSION: At some point before the questions about a reduction schedule, it should be clear that scientific reviews will be undertaken, that could be used to trigger subsequent reductions, if and as justified by the assessments. Alternatively, this information could be presented even before the freeze takes effect, but I prefer your construction.

Also, at some point we will want to make explicit what I believe we all agree on about the nature of the assessments. The protocol should specify the "technological" and "economic" factors as well as the scientific understanding of the impact of the control measures (i.e., add to Article III.)

relationship of phase-down

On page 7, under B.2., I read the Chairman's text differently than the description here. The following sentence reflects my interpretation:

"The text provides for two alternative implementing mechanisms for a further 30% reduction: either an automatic 30% reduction 6 years after entry into force if affirmed by a majority vote of the parties; or an automatic 30% reduction 8 years after entry into force unless rejected by a two-thirds majority of the parties."

done

Further, I take it that the decision (affirm or reject) must be made either in 1990 (for the 1994 or 6 year option) or in 1992 (for the 1996 or 8 year option.) I recommend that these decision dates be reviewed by the negotiators, and made to better coincide with the assessments. The Chairman's text says: "...such decision should be taken not later than (2) (4) years after entry into force."

OMB 6/8

DRAFT

MEMORANDUM FOR THE DOMESTIC POLICY COUNCIL

FROM: THE ENERGY, NATURAL RESOURCES & ENVIRONMENT WORKING GROUP

SUBJECT: Stratospheric Ozone

On May 20, 1987, the Council met to discuss the international protocol negotiations currently underway to limit emissions of ozone depleting chemicals.

Several questions were raised and the Working Group was asked to provide answers. The questions were:

* What are the legislative and legal impacts of an international ozone protocol?

* What are the most up-to-date scientific data on climatic and health effects of ozone depletion?

* What is the cost/benefit effect of an international treaty restricting ozone depleting chemicals?

The following information has been summarized by the Working Group after discussion of detailed presentations by experts in each area.

Legislative/legal

A pending lawsuit against the EPA seeks to compel the Administrator to promulgate regulations governing stratospheric ozone and to schedule such regulation. The court is not likely to act as long as international negotiations continue. If the international negotiations result in a scheduled reduction, the EPA would have sound defenses to any attempt by the plaintiff or the court to impose substantive emissions levels through the lawsuit. However, if there is no international agreement, it will be difficult to continue to argue for no domestic regulation, either in the existing lawsuit or in future litigation. EPA will be hard pressed to ask for more time to study the issue having initiated study of the issue eight years ago.

To date legislative action has been restrained by strong opponents of domestic legislation (such as Congressman Dingell). If the international negotiations for a protocol fail, there will be a strong push for a unilateral domestic reduction on Capitol Hill. Key Senators and Congressmen have been making statements

to this effect for months; recent press attention will only heighten that resolve. If the protocol called for a freeze or a freeze plus a 20 percent reduction, the legislative outcome is less certain though Congress would undoubtedly hold additional hearings to determine the need for further domestic reductions. If, on the other hand, the protcol mandated a freeze plus a 50 percent reduction, it seems likely that any pressure for additional regulation domestically would dissipate. Environmental groups, which were initially backing a 95 percent target, have agreed that a freeze plus 50 percent reduction would be a very positive beginning. Without a strong push from these groups, additional action, congressional action, at least in the near term, would be unlikely.

Climatic

Both satellite and ground-based observations have shown that ozone has decreased in the upper stratosphere by about seven percent during the last decade. Total column ozone has decreased by about 4 percent since 1980. It is not known whether natural phenomena or CFC and Halon emissions have caused these decreases.

Continued growth of CFC and Halon emissions at three ~~percent~~ per year (as consistent with economic projections) ~~is~~ predicted to yield, by the year 2040, a globally averaged overhead-column ozone depletion of about 6 percent and a stratospheric ozone depletion of about 50 percent. These depletion levels are much larger than natural variability and are, therefore, significant.

In contrast, a true global freeze of the sum of worldwide emissions of chlorine and bromine containing chemicals at the present rates is predicted to yield a maximum globally averaged column depletion of less than 0.5 percent by the year 2015 and a stratospheric depletion of 25 percent in the next 100 years. This stratospheric depletion would be much larger than natural variability and would, therefore, be significant. (Note that a "true global freeze" is not realistically attainable given expected compliance problems and the anticipated concessions to developing countries.) The theories and models upon which these predictions are based have uncertainty factors of two to three.

Health

Depletion of the ozone ~~layer~~ would result in increased penetration of biologically damaging ultraviolet radiation (UV-B) to the earth's surface. Based on the research completed to date, greater exposure to UV-B radiation has been linked to increases in the number of skin cancers and cataracts, suppression of the human immune response system, damage to crops and aquatic organisms, and increased formation of ground-level ozone (smog).

total ozone column

Based on epidemiological and ecological studies, dose-response relationshps were developed and reviewed as part of EPA's risk assessment. The extent of additional cancer deaths will depend on the degree of CFC control. If today's ~~ozone~~ level is maintained, the projected number of skin cancer deaths for White U.S. citizens born before 2075 would be 2,100,000. If the ozone level is decreased by 26 percent, there would be a projected increase in the number of skin cancer deaths of 1,200,000 over the base of 2,100,000. For an ozone level decrease of 7.7 percent (the likely result of a freeze included in the protocol), there would be an increase in skin cancer deaths of 253,000 over the case in which there was no ozone depletion. For an ozone level decrease of 6.1 percent (the likely result of a 20 percent reduction in emissions), there would be an increase in skin cancer deaths of 168,000 over the base. For an ozone level decrease of 3.2 percent (a 50 percent reduction), there would be an increase in skin cancer deaths of 89,000 over the base. This analysis assumes that the average age of the population remains constant, that exposure to sunlight (e.g., sunbathing) does not increase, and ~~that no major improvements~~ in treatment of skin cancer occur.

use ranges for skin cancer deaths

10.0 – 14.9 Million

Recent studies have also shown a strong dose-response relationship between UV-B and the incidence of cataracts. Approximately ~~12.5~~ million cases in the U.S. could be averted by a protocol freeze for cohorts born by 2075. A 50 percent reduction in the major CFCs would result in approximately ~~16.3~~ million cases averted. While laboratory studies link UV-B to suppression of the human response system with possible implications for incresing the incidence of herpes simplex and leishmaniasis, research into possible broader implications has not been undertaken.

13.1 – 19.6

Limited studies have examined the effects of increased UV-B radiation on plants and aquatic organisms. Five years of field studies of soy beans provide the most extensive data and suggest potentially large losses in yield. Laboratory studies of UV-B effects on aquatic organisms show changes in community composition and reduced breeding season for phytoplankton and loss of larvae for higher ~~order~~ fish. Potential implications for the aquatic food chain have not been studied.

from the most popular soybean varieties

Cost/Benefit

A cost benefit analysis has been performed for the projected skin cancer deaths, skin cancer non-fatal cases, and cataracts health effects projected from increased UV-B radiation occuring at the projected baseline growth of CFC emissions and at the levels of emissions contemplated by a protocol freeze of emissions, a 20 percent reduction thereof, and a further 30 percent reduction thereof. Such analysis involves economic uncertainties and is not being presentd with respect to the benefits derived from

in addition to the health effects uncertainties

reducing the incidence of UV-B on plants, aquatic life, the human immune system, ground level ozone concentrations, polymer degradation, and global temperature because of the lack of sufficient quantitative experimental information. However, the benefits of these non quantifiably evaluated benefits are acknowledged to exist and to be additive to the other benefits which were valued and computed.

A range of assumptions was used in the analysis. The key variations in the assumptions were the valuations of lives saved (two million and four million were used) and the discount rates for the costs and the benefits. Four percent and six percent were used for the benefits and the costs were evaluated at the same rate.

Sensitivity analysis was performed with respect to the economic valuation of lives saved and the growth in their value over time.

The uncertainty in the underlying data from which the individual health effects were calculated was not separately estimated. The central values for health effects from the EPA risk Assessment Analysis were used in the cost benefit analysis. In order to bound the benefit assumptions by the uncertainty in the underlying health effects data, climate models, etc., the calculated benefits should be reduced or multiplied by a significant factor which could be as much as ____ percent reduction of a _____ fold multiplation.

The conclusions of the analysis, which are shown in table form in Appendix _____, are as follows:

--The benefits from a "protcol freeze" of the CFC emissions are substantially more than the costs over all plausible assumptions and ranges of uncertainty.

--The aggregate benefits of a "protocol freeze" plus a 20 percent reduction in CFC emissions are also in almost all plausible cases substantially in excess of the costs.

--~~However,~~ the benefits of the 20 percent reduction ~~alone~~ are ~~not in all cases in excess of the costs of the 20 percent reduction alone~~.

--The costs of the further 30 percent reduction appear in many cases to exceed the benefits from the further 30 percent reduction.

QUESTIONS FOR DECISION

DPC guidance is sought on the following six issues involved in the stratospheric ozone negotiations.

Incremental benefit cost ratios

Step	@ 4%	@ 6%
Protocol freeze	97 - 402	29 - 132
Going beyond the freeze to a 20% reduction	2.6 - 7	0.7 - 3
Going beyond the 20% reduction to a 50% reduction	1.6 - 5	0.4 - 1.8

The decisions of whether to take each step can only be evaluated validly by comparing the incremental costs and benefits of that step.!

IMPACT OF CHLOROFLUOROCARBONS ON ATMOSPHERIC OZONE:

OSTP 6/8

Emissions of CFCs and Halons may be depleting the stratospheric ozone layer, reducing the screen against harmful ultraviolet radiation and altering the Earth's climate system. Continued growth of CFC and Halon emissions at 3% per year is predicted to yield a globally averaged column ozone depletion of 6% by the year 2040, and more thereafter, which is ~~much~~ greater than the natural decadal variability ~~and hence significant~~. In contrast a true global freeze of the sum of all CFCs and Halons at the present rate is predicted to yield a maximum global average ozone depletion of less than 1%. Ozone depletions at high latitudes are predicted to be 2-3 times larger than the global average. Depletions in upper stratospheric ozone greater than 25% are predicted to occur in both cases which would lead to a local cooling greater than natural variability. The consequences of this cooling for the Earth's climate are unclear. While these theories simulate much of the present atmosphere quite well, they are not perfect, ~~which places~~ a factor of 2-3 uncertainty on their predictive abilities.

Observations have shown that the total (1) column ozone increased about 3% from 1960 to 1970, remained constant throughout the 1970's, and has decreased thereafter by about 4%; (2) a decrease of about 7% during the last decade in the upper stratosphere; and (3) a 40% decrease in column ozone over Antarctica in the spring season since the mid-1970's. Whether the recent changes in column and upper stratospheric ozone are due to natural phenomena or in part to CFCs remains an open question.

To limit column and upper stratospheric ozone depletions to less than the decadal natural variability reductions beyond a true global freeze may be required. A protocal that reduces emissions as much as 20-50 percent could fall short of a true global freeze since it will not include all chemicals, compliance in developed countries may be less than 100 percent, and substantial growth in CFC usage may occur in developing countries. If there is environmental damage due to CFCs and Halons their long atmospheric lifetimes would mean that recovery would take many decades even after complete cessation of emissions.

This is indicative of the range of natural variability of the total ozone

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

June 9, 1987

MEMORANDUM FOR VICKY MASTERMAN

FROM: BEVERLY BERGER

SUBJECT: DPC STRATOSPHERIC OZONE DRAFT PAPER

Attached is the OSTP recommendation for an additional question to be added to Section B.2.: Questions Relating to Reductions Beyond a Freeze. It is recommended that this be put in as item c.

Attachment

June 9, 1987

OSTP Input to Section B.2. of the 9 June DPC
Stratospheric Ozone Draft Paper

c. Should the U.S. agree, at this time, to an international process which could commit the U.S. to future reductions or reduction schedules that it may conclude from future science reviews are unwarranted and it does not want?

The Circular 175 authorized negotiations on long-term scheduled reductions of emissions subject to "regular assessment of the science". The next major science review is scheduled for completion in January 1990.

There are strong views on this question within the Working Group but no consensus was developed.

VM's Master 6/9 12:00 noon

MEMORANDUM FOR THE DOMESTIC POLICY COUNCIL

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Several questions were raised and the Working Group was asked to provide answers. The questions were:

* What are the legislative and legal impacts of an international ozone protocol?

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* What is the cost/benefit effect of an international treaty restricting ozone depleting chemicals?

The following information has been summarized by the Working Group after discussion of detailed presentations by experts in each area.

Climatic and Atmospheric

[Bulletized version due from NASA and OSTP]

Emissions of CFCs and Halons may be depleting the stratospheric ozone layer, reducing the screen against harmful ultraviolet radiation and altering the Earth's climate system. Continued growth of CFC and Halon emissions at 3% per year is predicted to yield a globally averaged column ozone depletion of 6% by the year 2040, and more thereafter, which is much greater than the natural decadal variability and hence significant. In contrast a true global freeze of the sum of all CFCs and Halons at the present rate is predicted to yield a maximum global average ozone depletion of less than 1%. Ozone depletions at high latitudes are predicted to be 2-3 times larger than the global average. Depletions in upper stratospheric ozone greater than 25% are predicted to occur in both cases which would lead to a local cooling greater than natural variability. The consequences of this cooling for the Earth's climate are unclear. While these theories simulate ~~much of~~ the present atmosphere ~~quite well~~, they

are not perfect, which places a factor of 2-3 uncertainty on their predictive abilities.

Observations have shown (1) column ozone increased about 3% from 1960 to 1970, remained constant throughout the 1970's, and has decreased thereafter by about 4%; (2) a decrease of about 7% during the last decade in the upper stratosphere; and (3) a 40% decrease in column ozone over Antarctica in the spring season since the mid-1970's. Whether the recent changes in column and upper stratospheric ozone are due to natural phenomena or in part to CFCs remains an open question.

To limit column and upper stratospheric ozone depletions to less than the decadal natural variability reductions beyond a true global freeze may be required. A protocol that reduces emissions as much as 20-50 percent could fall short of a true global freeze since it will not include all chemicals, compliance in developed countries may be less than 100 percent, and substantial growth in CFC usage may occur in developing countries. If there is environmental damage due to CFCs and Halons their long atmospheric lifetimes would mean that recovery would take many decades even after complete cessation of emissions.

Health

[Bulletized version due from EPA and OSTP]

Depletion of the ozone layer would result in increased penetration of ~~biologically damaging~~ ultraviolet radiation (UV-B) to the earth's surface. Based on the research completed to date, greater exposure to UV-B radiation has been linked to increases in the number of skin cancers and cataracts, suppression of the human immune response system, damage to crops and aquatic organisms, and increased formation of ground-level ozone (smog).

Based on epidemiological and ecological studies, dose-response relationshps were developed and reviewed as part of EPA's risk assessment. The extent of additional cancer deaths will depend on the degree of CFC control. If today's ozone level is maintained, the projected number of skin cancer deaths for white U.S. citizens born before 2075 (a total population of over 600,000,000) would be 3,000,000. If the ozone level is decreased by 26 percent, there would be a projected increase in the number of skin cancer deaths of 1,900,000 over the base of 2,100,000. For an ozone level decrease of 7.7 percent (the likely result of a protocol freeze), there would be an increase in skin cancer deaths of 300,000 over the case in which there was no ozone depletion. For an ozone level decrease of 6.1 percent (the likely result of a 20 percent reduction in emissions), there would be an increase in skin cancer deaths of 200,000 over the base. For an ozone level decrease of 3.2 percent (a 50 percent reduction), there would be an increase in skin cancer deaths of

J.B. disagreement among scientists about the linkage. "Is believed by EPA to be linked!"

EPA predicts that

when?

what mean? growth level or freeze? "global column ozone is maintained at 1986 levels"

→ How much longer will they live

100,000 over the base. This analysis assumes that exposure to sunlight (e.g., sunbathing) does not ~~increase~~, that no major improvements in treatment of skin cancer occur, and that ozone depletion ~~does not~~ increase ~~after~~ 2100. The uncertainties in the total estimates of additional cases are due to uncertainties about the action spectra, predicted ozone depletion, and the dose-response co-efficients. There is a 90% probability that the actual cases will be between 20% and 260% of the estimated value, and a fifty percent probability that it will be between 50% and 125% as great.

Recent studies have also shown a strong dose-response relationship between UV-B and the incidence of cataracts. Approximately 12.5 million cases in the U.S. could be averted by a protocol freeze for the 600 million citizens born by 2075. A 50 percent reduction in the major CFCs would result in approximately 16.3 million cases averted. While laboratory studies link UV-B to suppression of the human response system with possible implications for increasing the incidence of herpes simplex and leishmaniasis, research into possible broader implications has not been undertaken and the quantitiative impact is not projected.

Limited studies have examined the effects of increased UV-B radiation on plants and aquatic organisms. Five years of field studies of soy beans provide the most extensive data and suggest potentially large losses in yield for this species. Laboratory studies of UV-B effects on aquatic organisms show changes in community composition and reduced breeding season for phytoplankton and loss of larvae for higher order fish. Potential implications for the aquatic food chain have not been studied.

Cost/Benefit

[Bulletized version due from CEA]

A cost benefit analysis has been performed for the projected skin cancer deaths, skin cancer non-fatal cases, and cataracts health effects projected from increased UV-B radiation occuring at the projected baseline growth of CFC emissions and at the levels of emissions contemplated by a protocol freeze of emissions, a 20 percent reduction thereof, and a further 30 percent reduction thereof. Such analysis involves substantial economic uncertainties and is not being presented with respect to the benefits derived from reducing the incidence of UV-B on plants, aquatic life, the human immune system, ground level ozone concentrations, polymer degradation, and global temperature because of the lack of sufficient quantitative experimental information. However, the benefits of these non-quantifiably evaluated benefits are acknowledged to exist and to be additive to the other benefits which were estimated.

A range of assumptions was used in the analysis. The key variations in the assumptions were the valuations of lives saved (two million and four million were used) and the discount rates for the costs and the benefits. Four percent and six percent were used for the benefits and the costs were evaluated at the same rate.

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The uncertainties in the underlying data from which the individual health effects were calculated was not separately estimated. The central values for health effects from the EPA Risk Assessment Analysis were used in the cost benefit analysis. In order to bound the benefit assumptions by the uncertainty in the underlying health effects data, climate models, etc., the calculated benefits should be reduced or multiplied by a significant factor which could be as much as ____ percent.

The conclusions of the analysis are as follows:

--The benefits from a "protocol freeze" of the CFC emissions are substantially more than the costs over all plausible assumptions and ranges of uncertainty.

--The aggregate benefits of a "protocol freeze" plus a 20 percent reduction in CFC emissions are also in almost all plausible cases substantially in excess of the costs.

--However, the marginal benefits of the additional 20 percent reduction beyond the freeze are not in all cases in excess of the marginal costs of the additional 20 percent reduction.

--The marginal costs of a further 30 percent reduction (beyond the freeze plus 20%) appear in some cases to exceed the benefits from a further 30 percent reduction. It is also true that in some cases examined the marginal benefits exceed the marginal costs for this incremental 30% step. Further scientific and economic review will be valuable before making the final decision on this step.

ISSUES AND DISCUSSION

At the May 20, 1987 DPC meeting, the head of the U.S. delegation to the international ozone negotiations provided an overview of the progress and the status of the negotiations. The November 28, 1986 Circular 175 authorized the U.S. delegation to negotiate a protocol providing for: (approved by Under Sec of State Allen Wallis)

I. A near-term freeze on the combined emissions of the most

negot'g countries have been asked to submit views on the Chairman's Text.

ozone-depleting substances;

II. A long-term scheduled reduction of emissions of these chemicals down to the point of eliminating emissions from all but limited uses for which no substitutes are commercially available (such reduction could be as much as 95 percent), subject to III; and

III. Periodic review of the protocol provisions based upon regular assessment of the science. The review could remove or add chemicals, or change the schedule or the emission reduction target. ~~DPC guidance is now sought on the following issues.~~

The int'l negot's to date pursuant to Circular 175 have resulted in a Chairman's Text which

insert A

~~DPC guidance to the U.S. negotiators is now sought on the following issues.~~

The following are the issues on which the WG feels guidance may be approp.

A. PARTICIPATION AND TRADE PROVISIONS

There remain many complex issues in the international negotiations pertaining to fair trade provisions and the participation of developing countries.

reword?

1. Should the U.S. delegation seek maximum international participation in the control protocol?

options?
- a) go for it
- b) insist
- d) reassess in future

The U.S. and the United Nations Environment Program have expended considerable effort (e.g. through our Embassies and through paying travel costs) to encourage broad participation by developing countries. However, only relatively few have shown the interest or the expertise to participate. Parties to the protocol would not be able to prevent non-joining countries from producing CFCs for their internal market, but would be able to prevent them from profiting through international trade with protocol parties.

A strong protocol, including the major producing and consuming countries, could lead to earlier development of substitute products. This might discourage non-joiners from investing heavily in capacity in a soon-to-be obsolescent CFC technology. Further, the very existence of a protocol, as an expression of concern by the international community, increases the pressure on non-member countries to join; in essence, if they continue to produce CFCs, they are exposed as behaving irresponsibly on a matter of global import.

Some have asked whether the U.S. should insist upon, or seek, participation of countries in accordance with predetermined U.S. criteria. Such criteria would be, for ex., the specification of countries, a formula requiring minimum participation of

price the U.S. accepting the protocol

countries producing ~~a specified percentage of the total global CFC/Halon production, and~~ countries accounting for a specified portion of the world population.

To encourage the participation of developing countries, some favor granting developing countries a grace period from compliance with protocol provisions. Such a grace period would be allowed in recognition of the importance of having global participation in the 21st century, and in recognition of the fact that developing countries have not ~~reaped~~ received the benefits of CFC and Halon use.

The Working Group consensus is that the delegation continue to negotiate for as broad a level of participation as possible.

Voting ~~criteria~~ in the Protocol

2. What should be the U.S. objective regarding voting among parties to the protocol?

The Working Group ~~consensus is~~ that the delegation negotiate for a system of voting which would ~~credit~~ the major producing and consuming countries.

3. ~~What should be the U.S. objective regarding the Control~~ formula and trade provisions?

~~It is the consensus of~~ the Working Group that the U.S. delegation seek to include in the protocol an effective formula to control emissions with accountability, the fewest possible restrictions on the flow of trade and capital among parties, the most favorable formula for U.S. industry, and strong monitoring and reporting provisions.

Since it is not possible to measure emissions directly, the negotiators are exploring alternative formulas to control emissions which consider production, consumption, imports and destruction.

The U.S. has pushed for a strong protocol article on trade sanctions to be imposed on parties which have not signed the protocol. This would limit imports not only of the controlled chemicals but also of products containing these chemicals (e.g., air conditioners or foam insulation). The U.S. has pushed for a study of the feasibility of limiting imports of products manufactured using the controlled chemicals (e.g., electronic equipment). The intent of the trade article would be to provide a "stick" for encouraging others to join and to limit the impact on ozone depletion and the transfer of commercial benefits from parties to the protocol to countries which have not joined.

4. Should the U.S. receive "credit" for its 1978 unilateral voluntary ban on CFC-producing non-essential aerosols?

Some believe that the U.S. ought to receive recognition in the protocol for its 1978 voluntary unilateral action to reduce CFC emissions by banning non-essential aerosols. One form of such recognition may be to require other countries to ban non-essential aerosols in addition to meeting other protocol requirements. ~~The U.S. delegation strongly objects to raising this issue again.~~ The ~~delegation~~ attempted unsuccessfully to get such credit during the negotiation of the Vienna Convention on the ozone layer, and the delegation believes that if the U.S. were to insist upon such credit as a condition of a protocol, the negotiations would deteriorate.

5. ~~4.~~ Should the U.S. negotiators insist upon or seek protocol provisions providing for reporting, monitoring, verification and enforcement provisions?

The U.S. delegation is working through many complex issues relating to enforcement of a potential protocol. A system of on-site inspections for the presence of new or expanded CFC-producing facilities would be expensive and probably ineffective because of the large land areas involved. Trade provisions could at least prevent entry of such production into international trade.

Some favor the U.S. negotiating for strong monitoring and reporting provisions, and exploring the feasibility and cost effectiveness of establishing ad hoc inspection teams to investigate any alleged violations of protocol requirements.

B. AN EMISSIONS CONTROL PROTOCOL

~~In accordance with the existing Circular 175, the negotiators have produced a Chairman's Text of a proposed emissions control protocol.~~ The Chairman's Text contains a series of proposals related to (1) a freeze on emissions, and (2) emissions reductions beyond a freeze. ~~There are many remaining questions relating to potential emissions control provisions.~~

1. Questions Relating to a Freeze on Emissions

a. What chemicals should the freeze cover?

The Chairman's Text provides for a freeze on emissions at

Due to a technicality, Halons are not now included.

1986 levels which would cover CFCs 11, 12, 113, 114, and 115.

The Working Group consensus is that the freeze should include all of these CFCs as well as ~~and~~ Halons 1201 and 1311. The U.S. delegation will be seeking to expand the protocol to include the Halons.

From a purely scientific perspective all chlorine and bromine containing chemicals, weighted by their ozone depleting potential should be considered for the protocol. This should be the case for both the freeze and for potential future reductions. The Chairman's Text is, therefore, already less ~~than logical from a~~ purely scientific perspective because only the fully halogenated chemicals (CFCs 11, 12, 113, 114 and 115, and Halons 1201 and 1311) are being considered for inclusion. Chemcials such as CFC 22 and methyl chloroform which are only partially halogenated are not being considered as ~~EPA correctly believed them~~ to be part of the solution as they have relatively low ozone depleting potential.

Concern has been raised with regards to reductions in Halons 1201 and 1311 and CFC 113 because of their strategic value to the U.S., and the apparent lack of suitable substitutes. This is a legitimate concern but can ~~easily~~ be taken care of if controls are not on individual substances but on the sum of the ozone depleting potential of all chemicals. This allows each ~~individual~~ country the ~~maximum~~ flexibility to live within the internationally agreed protocol with the least interference on how each country wants to implement the protocol.

b. When should a freeze on emissions occur?

The Chairman's Text proposes that the freeze take effect within two years of entry into force. There is uncertainty as to when entry into force will occur; it ~~could occur as early as 1988~~. The Working Group consensus is that a freeze on emissions should go into effect within one to two years after entry into force of the protocol.

~~With respect to the potential freeze, some have asked how the level of participation in the protocol freeze will affect the need for further reductions beyond the freeze. This is an important question in that low participation in a freeze may result in no cessation of emissions of ozone-depleting chemicals.~~

2. Questions Relating to Reductions Beyond a Freeze

coverage = the base from which we take the CFC equiv reduc.

a. What chemicals should the reductions cover?

The Chairman's Text proposes that the additional reductions beyond a freeze include CFCs 11, 12, 113, 114 and 115.

The Working Group consensus is that any additional reductions should cover CFCs 11 and 12; however, there are questions about the coverage of CFCs 113, 114, 115, and Halons 1201 and 1311. National security concerns argue against including the Halons in any ~~of the~~ reductions ~~beyond a freeze~~. There is also a national defense and security concern with including CFC 113 in any reductions beyond a freeze, especially given 113's importance for certain high-technology electrical applications. The questions regarding coverage of CFCs 114 and 115 concern their potential use as substitutes for controlled chemicals and their present low usage.

? - aggregate or diff'l?

State: all CFCs have to go in the reduc sched or the "Some agencies question" the coverage

b. How much and when?

The Chairman's Text provides for a 20% reduction to take effect 4 years after entry into force (1992) and a 30% reduction to take effect either 6 years (1994) or 8 years (1996) after entry into force.

-94 -96 -92

The Working Group has identified distinct issues surrounding each potential reduction. With respect to the 20% reduction, some favor it because it can be accomplished with existing industrial processes and because reductions beyond a freeze may be needed to counterbalance less than full participation in a freeze. Yet others note there are uncertainties as to the need for any additional reductions ~~beyond a freeze~~.

Regarding the additional 30% reduction, some favor its inclusion on the basis of the science and potential adverse health effects. Others emphasize, however, the uncertainties about the need to commit at this time to this additional measure. their judgments of the science

One or more new scientific reviews will be available prior to this reduc going into effect.

c. Should the reductions be automatic (subject to reversal by a 2/3 vote) or contingent upon a positive vote of a majority of the parties?

The Chairman's Text provides for the initial 20% reduction to take effect automatically (subject to reversal by a 2/3 vote). implicitly

The Text provides two alternative implementing mechanisms for the next 30% reduction -- either 6 years after entry

into force if the majority of the parties so decide, or 8 years after entry into force unless reversed by a two-third majority of the parties.

There are strong views in the Working Group on the implementing mechanism for the additional 30% percent reduction. Many do not wish to commit to the reduction at this time unless it is contingent upon a positive vote of a majority of the parties. Others, however, believe the evidence warrants committing to this reduction at this time.

C. RELATIONSHIP BETWEEN INTERNATIONAL PROTOCOL AND DOMESTIC REGULATION

The overall objective of the protocol is to avoid or reduce health and environmental risks. Compliance with the international protocol necessarily results in domestic regulation. Yet there is no reason why the Nation's efforts to achieve these objectives should be limited to a regulatory approach.

The suggestion has been made that it is only fair for the government which imposes such regulatory burdens upon the people and the economy of the U.S. to consider policies which may ease the regulatory burdens, including, but not limited to, possibly rendering unnecessary imposition of regulations beyond those necessary to assure U.S. compliance with the international protocol.

Such a domestic, non-regulatory supplement to the international procol might, for example, contain elements intended to eliminate government barriers to, or facilitate, the development of: substitutes for covered chemicals, technology to mitigate or eliminate the adverse effects of chemical emissions upon stratospheric ozone, or medical advancements in the understanding and treatment of the problems caused by ozone depletion.

The recommendation has been made that the DPC direct the Working Group to consider and report its recommendations concerning such domestic non-regulatory alternatives.

Jan's Last Word.

ozone-depleting substances;

II. A long-term scheduled reduction of emissions of these chemicals down to the point of eliminating emissions from all but limited uses for which no substitutes are commercially available (such reduction could be as much as 95 percent), subject to III; and

III. Periodic review of the protocol provisions based upon regular assessment of the science. The review could remove or add chemicals, or change the schedule or the emission reduction target.DPC guidance is now sought on the following issues.

DPC guidance to the U.S. negotiators is now sought on the following issues.

A. PARTICIPATION AND TRADE PROVISIONS

There remain many complex issues in the international negotiations pertaining to ~~fair~~ trade provisions and the participation of developing ~~countries~~.

COULD DISCOURAGE BUT

1. Should the U.S. delegation seek maximum international participation in the control protocol?

DEVELOPING COUNTRIES

The U.S. and the United Nations Environment Program have expended considerable effort (e.g. through our Embassies and through paying travel costs) to encourage broad participation by ~~developing countries~~. However, only relatively few have shown the interest or the expertise to participate. Parties to the protocol would not be able to prevent non-joining countries from producing CFCs for their internal market, but would be able to prevent them from profiting through international trade.

A strong protocol, including the major producing and consuming countries, could lead to earlier development of substitute products. This might discourage non-joiners from investing heavily in capacity in a soon-to-be obsolescent CFC technology. Further, the very existence of a protocol, as an expression of concern by the international community, increases the pressure on non-member countries to join; in essence, if they continue to produce CFCs, they are exposed as behaving irresponsibly on a matter of global import.

Some have asked whether the U.S. should insist upon, or seek, participation of countries in accordance with predetermined U.S. criteria. Such criteria would be the specification of countries, a formula requiring minimum participation of

48 NATIONS COMPRISING ABOUT 70% OF WORLD PRODUCTION AND CONSUMPTION HAVE PARTICIPATED TO DATE.

countries producing a specified percentage of the total global CFC/Halon production, and countries accounting for a specified portion of the world population.

To encourage the participation of developing countries, some favor granting developing countries a grace period from compliance with protocol provisions. Such a grace period would be allowed in recognition of the importance of having global participation in the 21st century, and in recognition of the fact that developing countries have not reaped the benefits of CFC and Halon use.

The Working Group consensus is that the delegation continue to negotiate for as broad a level of participation as possible.

2. <u>What should be the U.S. objective regarding voting among parties to the protocol?</u>

The Working Group consensus is that the delegation negotiate for a system of voting which would ~~credit~~ REQUIRE AGREEMENT OF the major producing and consuming countries.

3. <u>What should be the U.S. objective regarding the control formula and trade provisions?</u>

It is the consensus of the Working Group that the U.S. delegation seek to include in the protocol an effective formula to control emissions with accountability, the fewest possible restrictions on the flow of trade and capital among parties, the most favorable formula for U.S. industry, and strong monitoring and reporting provisions. BUT WITH NO GREATER RESTRICTIONS IMPOSED ON TRADE INVOLVING THE US THAN ARE IMPOSED AND ENFORCED BY OTHER COUNTRIES.
Since it is not possible to measure emissions directly, the negotiators are exploring alternative formulas to control emissions which consider production, consumption, imports and destruction.

The U.S. has pushed for a strong protocol article on trade sanctions to be imposed on parties which have not signed the protocol. This would limit imports not only of the controlled chemicals but also of products containing these chemicals (e.g., air conditioners or foam insulation). The U.S. has pushed for a study of the feasibility of limiting imports of products manufactured using the controlled chemicals (e.g., electronic equipment). The intent of the trade article would be to provide a "stick" for encouraging others to join and to limit the impact on ozone depletion and the transfer of commercial benefits from parties to the protocol to countries which have not joined.

into force if the majority of the parties so decide, or 8 years after entry into force unless reversed by a two-third majority of the parties.

There are strong views in the Working Group on the implementing mechanism for the additional 30% percent reduction. Many do not wish to commit to the reduction at this time unless it is contingent upon a positive vote of a majority of the parties. Others, however, believe the evidence warrants committing to this reduction at this time.

C. RELATIONSHIP BETWEEN INTERNATIONAL PROTOCOL AND DOMESTIC REGULATION

The overall objective of the protocol is to avoid or reduce health and environmental risks. Compliance with the international protocol necessarily results in domestic regulation. Yet there is no reason why the Nation's efforts to achieve these objectives should be limited to a regulatory approach.

~~The suggestion has been made that it is only fair for the government which imposes such regulatory burdens upon the people and the economy of the U.S. to consider policies which may ease the regulatory burdens, including, but not limited to, possibly rendering unnecessary imposition of regulations beyond those necessary to assure U.S. compliance with the international protocol.~~

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The recommendation has been made that the DPC direct the Working Group to consider and report its recommendations concerning such domestic non-regulatory alternatives. CONSISTENT WITH ADMINISTRATION POLICY.

ozone-depleting substances;

II. A long-term scheduled reduction of emissions of these chemicals down to the point of eliminating emissions from all but limited uses for which no substitutes are commercially available (such reduction could be as much as 95 percent), subject to III; and

III. Periodic review of the protocol provisions based upon regular assessment of the science. The review could remove or add chemicals, or change the schedule or the emission reduction target.DPC guidance is now sought on the following issues.

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There remain many complex issues in the international negotiations pertaining to fair trade provisions and the participation of developing countries.

1. Should the U.S. delegation seek ~~maximum~~ international participation in the control protocol?

The U.S. and the United Nations Environment Program have expended considerable effort (e.g. through our Embassies and through paying travel costs) to encourage broad participation by developing countries. However, only relatively few have shown the interest or the expertise to participate. Parties to the protocol would not be able to prevent non-joining countries from producing CFCs for their internal market, but would be able to prevent ~~them~~ from profiting through international trade.

A strong protocol, including the major producing and consuming countries, could lead to earlier development of substitute products. This might discourage non-joiners from investing heavily in ~~capacity in a soon-to-be obsolescent~~ CFC technology. Further, the very existence of a protocol, as an expression of concern by the international community, increases the pressure on non-member countries to join; in essence, if they continue to produce CFCs, they are exposed as behaving irresponsibly on a matter of global import.

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countries producing a specified percentage of the total global CFC/Halon production, and countries accounting for a specified portion of the world population.

To encourage the participation of developing countries, some favor granting developing countries a grace period from compliance with protocol provisions. Such a grace period would be allowed in recognition of the importance of having global participation in the 21st century, and in recognition of the fact that developing countries have not reaped the benefits of CFC and Halon use. An issue to be resolved is the length of the grace period and the extent to which developing countries would be permitted to produce or consume CFCs during such period.

~~The Working Group consensus is that the delegation continue to negotiate for as broad a level of participation as possible.~~

2. What should be the U.S. objective regarding voting among parties to the protocol?

The Working Group consensus is that the delegation negotiate for a system of voting which would credit the major producing and consuming countries.

3. What should be the U.S. objective regarding the control formula and trade provisions?

It is the consensus of the Working Group that the U.S. delegation seek to include in the protocol an effective formula to control emissions with accountability, the fewest possible restrictions on the flow of trade and capital among parties, the most favorable formula for U.S. industry, and strong monitoring and reporting provisions.

Since it is not possible to measure emissions directly, the negotiators are exploring alternative formulas to control emissions which consider production, consumption, imports and destruction.

The U.S. has pushed for a strong protocol article on trade sanctions to be imposed on parties which have not signed the protocol. This would limit imports not only of the controlled chemicals but also of products containing these chemicals (e.g., air conditioners or foam insulation). The U.S. has pushed for a study of the feasibility of limiting imports of products manufactured using the controlled chemicals (e.g., electronic equipment). The intent of the trade article would be to provide a "stick" for encouraging others to join and to limit the impact on ozone depletion and the transfer of commercial benefits from parties to the protocol to countries which have not joined.

To be decided is whether trade sanctions also should be applicable to parties which materially violate their protocol obligations.

Otherwise, many nations might be able to meet their obligation to reduce CFC emissions through the simple expedient of banning such aerosols, while the US is required to cut back on other products using CFCs.

4. Should the U.S. receive "credit" for its 1978 unilateral voluntary ban on CFC-producing non-essential aerosols?

In addition to a freeze, other nations should ban non-essential aerosols as did in

Some believe that the U.S. ~~ought to receive recognition in the protocol for its~~ 1978 ~~voluntary unilateral action to reduce CFC emissions by banning non-essential aerosols.~~ One form of such recognition may be to require other countries to ban non-essential aerosols in addition to meeting other protocol requirements.

State and EPA

~~The U.S. delegation~~ strongly objects to raising this issue again. The delegation attempted unsuccessfully to get such credit during the negotiation of the Vienna Convention on the ozone layer, and the delegation believes that if the U.S. were to insist upon such credit as a condition of a protocol, the negotiations would deteriorate.

Because of the enforcement roles of EPA and environmental groups such as NRDC, US compliance with the protocol is apt to be substantial. Most other nations do not have such enforcement/monitoring mechanisms. No monitoring or verification system has been identified.

5. Should the U.S. negotiators insist upon or seek protocol provisions providing for reporting, monitoring, verification and enforcement provisions?

The U.S. delegation is working through many complex issues relating to enforcement of a potential protocol. A system of on-site inspections for the presence of new or expanded CFC-producing facilities would be expensive and probably ineffective because of the large land areas involved. Trade provisions could at least prevent entry of such production into international trade with parties to the protocol.

Some favor the U.S. negotiating for strong monitoring and reporting provisions, and exploring the feasibility and cost effectiveness of establishing ad hoc inspection teams to investigate any alleged violations of protocol requirements.

B. AN EMISSIONS CONTROL PROTOCOL

In accordance with the existing Circular 175, the negotiators have produced a Chairman's Text of a proposed emissions control protocol. The Chairman's Text contains a series of proposals related to (1) a freeze on emissions, and (2) emissions reductions beyond a freeze. There are many remaining questions relating to potential emissions control provisions.

1. Questions Relating to a Freeze on Emissions

a. What chemicals should the freeze cover?

The Chairman's Text provides for a freeze on emissions at

1986 levels which would cover CFCs 11, 12, 113, 114, and 115.

The Working Group consensus is that the freeze should include all of these CFCs as well as and Halons 1201 and 1311. The U.S. delegation will be seeking to expand the protocol to include the Halons.

From a purely scientific perspective all chlorine and bromine containing chemicals, weighted by their ozone depleting potential should be considered for the protocol. This should be the case for both the freeze and for potential future reductions. The Chairman's Text is, therefore, already less than logical from a purely scientific perspective because only the fully halogenated chemicals (CFCs 11, 12, 113, 114 and 115, and Halons 1201 and 1311) are being considered for inclusion. Chemcials such as CFC 22 and methyl chloroform which are only partially halogenated are not being considered as EPA ~~correctly~~ believes them to be part of the solution as they have relatively low ozone depleting potential.

Concern has been raised with regards to reductions in Halons 1201 and 1311 and CFC 113 because of their strategic value to the U.S., and the apparent lack of suitable substitutes. This is a legitimate concern but can ~~easily~~ be taken care of if controls are not on individual substances but on the sum of the ozone depleting potential of all chemicals. This allows each individual country the maximum flexibility to live within the internationally agreed protocol with the least interference on how each country wants to implement the protocol.

b. When should a freeze on emissions occur?

The Chairman's Text proposes that the freeze take effect within two years of entry into force. There is uncertainty as to when entry into force will occur; it could occur as early as 1988. The Working Group consensus is that a freeze on emissions should go into effect within one to two years after entry into force of the protocol.

With respect to the potential freeze, some have asked how the level of participation in the protocol freeze will affect the need for further reductions beyond the freeze. This is an important question in that low participation in a freeze may result in no cessation of emissions of ozone-depleting chemicals.

2. Questions Relating to Reductions Beyond a Freeze

a. What chemicals should the reductions cover?

The Chairman's Text proposes that the additional reductions beyond a freeze include CFCs 11, 12, 113, 114 and 115.

The Working Group consensus is that any additional reductions should cover CFCs 11 and 12; however, there are questions about the coverage of CFCs 113, 114, 115, and Halons 1201 and 1311. National security concerns argue against including the Halons in any of the reductions beyond a freeze. There is also a national defense and security concern with including CFC 113 in any reductions beyond a freeze, especially given 113's importance for certain high-technology electrical applications. The questions regarding coverage of CFCs 114 and 115 concern their potential use as substitutes for controlled chemicals.

b. How much and when?

The Chairman's Text provides for a 20% reduction to take effect 4 years after entry into force (1992) and a 30% reduction to take effect either 6 years (1994) or 8 years (1996) after entry into force.

The Working Group has identified distinct issues surrounding each potential reduction. With respect to the 20% reduction, some favor it because it can be accomplished with existing industrial processes and because reductions beyond a freeze may be needed to counterbalance less than full participation in a freeze. Yet others note there are uncertainties as to the need for any additional reductions beyond a freeze, and question whether safe and economical substitutes will be available in time to comply. Regarding the additional 30% reduction, some favor its inclusion on the basis of the science and potential adverse health effects. Others emphasize, however, the uncertainties about the need to commit at this time to this additional measure, and question whether substitutes will be available in time to comply.

c. Should the reductions be automatic (subject to reversal by a 2/3 vote) or contingent upon a positive vote of a majority of the parties?

The Chairman's Text provides for the initial 20% reduction to take effect automatically (subject to reverseal by a 2/3 vote).

The Text provides two alternative implementing mechanisms for the next 30% reduction -- either 6 years after entry

into force if the majority of the parties so decide, or 8 years after entry into force unless reversed by a two-third majority of the parties.

There are strong views in the Working Group on the implementing mechanism for ~~the additional 30% percent~~ reductions. Many do not wish to commit to the reduction at this time unless it is contingent upon a positive vote of a majority of the parties. Others, however, believe the evidence warrants committing to ~~the~~ reductions at this time.

C. RELATIONSHIP BETWEEN INTERNATIONAL PROTOCOL AND DOMESTIC REGULATION

The overall objective of the protocol is to avoid or reduce health and environmental risks. Compliance with the international protocol necessarily results in domestic regulation. Yet there is no reason why the Nation's efforts to achieve these objectives should be limited to a regulatory approach.

The suggestion has been made that it is only fair for the government which imposes such regulatory burdens upon the people and the economy of the U.S. to consider policies which may ease the regulatory burdens, including, but not limited to, possibly rendering unnecessary imposition of regulations beyond those necessary to assure U.S. compliance with ~~the international~~ protocol.

Such a domestic, non-regulatory supplement to the international protocol might, for example, contain elements intended to eliminate government barriers to, or facilitate, the development of: substitutes for covered chemicals, technology to mitigate or eliminate the adverse effects of chemical emissions upon stratospheric ozone, or medical advancements ~~in the~~ understanding and treatment of ~~the~~ problems caused by ozone depletion.

The recommendation has been made that the DPC direct the Working Group to consider and report its recommendations concerning such domestic non-regulatory alternatives.

6/8 Meeting Mark-up

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MEMORANDUM FOR THE DOMESTIC POLICY COUNCIL

FROM: THE ENERGY, NATURAL RESOURCES & ENVIRONMENT WORKING GROUP

SUBJECT: Stratospheric Ozone

On May 20, 1987, the Council met to discuss the international protocol negotiations currently underway to limit emissions of ozone depleting chemicals.

Several questions were raised and the Working Group was asked to provide answers. The questions were:

* What are the legislative and legal impacts of an international ozone protocol?

* What are the most up-to-date scientific data on climatic and health effects of ozone depletion?

* What is the cost/benefit effect of an international treaty restricting ozone depleting chemicals?

The following information has been summarized by the Working Group after discussion of detailed presentations by experts in each area.

Add - that negotiations are scheduled to close in Sept. '87.

TAKE OUT

Legislative/legal } oral ~~not~~ not written.

A pending lawsuit against the EPA seeks to compel the Administrator to promulgate regulations governing stratospheric ozone and to schedule such regulation. The court is not likely to force action as long as productive international negotiations continue. If the international negotiations result in a scheduled reduction, the EPA would have sound defenses to any attempt by the plaintiff or the court to impose substantive emissions levels through the lawsuit. However, if there is no international agreement, it will be difficult to continue to argue for no domestic regulation, either in the existing lawsuit or in future litigation. EPA will be hard pressed to ask for more time to study the issue, having initiated study of the issue eight years ago.

To date legislative action has been restrained by strong opponents of domestic legislation (such as Congressman Dingell). If the international negotiations for a protocol fail, there will be a strong push for a unilateral domestic reduction on Capitol Hill. Key Senators and Congressmen have been making statements

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to this effect for months; recent press attention will only heighten that resolve. If the protocol called for a freeze or a freeze plus an automatic 20 percent reduction with no potential for future reductions, the legislative outcome is less certain; Congress would undoubtedly hold additional hearings to determine the need for further domestic reductions. If, on the other hand, the protcol mandated a freeze plus a 50 percent reduction, it seems likely that any pressure for additional domestic regulation would dissipate. Environmental groups, which were initially backing a 95 percent target, have agreed that a freeze plus 50 percent reduction would be a very positive beginning; some of the active groups would settle for less than 50% but more than 20%. Without a strong push from these groups, additional congressional action, at least in the near term, would be unlikely.

change? Atmospheric } There is uncert.'y as to climatic effects
Climatic "cool the stratosphere --put both warming & cooling in bullets

Climate and Atmospheric

Emissions of CFCs and Halons may be depleting the stratospheric ozone layer, reducing the screen against harmful ultraviolet radiation and altering the Earth's climate system. Continued growth of CFC and Halon emissions at 3% per year is predicted to yield a globally averaged column ozone depletion of 6% by the year 2040, and more thereafter, which is much greater than the natural decadal variability and hence significant. In contrast a true global freeze of the sum of all CFCs and Halons at the present rate is predicted to yield a maximum global average ozone depletion of less than 1%. Ozone depletions at high latitudes are predicted to be 2-3 times larger than the global average. Depletions in upper stratospheric ozone greater than 25% are predicted to occur in both cases which would lead to a local cooling greater than natural variability. The consequences of this cooling for the Earth's climate are unclear. While these theories simulate much of the present atmosphere quite well, they are not perfect, which places a factor of 2-3 uncertainty on their predictive abilities.

Have Bob Watson's

Observations have shown (1) column ozone increased about 3% from 1960 to 1970, remained constant throughout the 1970's, and has decreased thereafter by about 4%; (2) a decrease of about 7% during the last decade in the upper stratosphere; and (3) a 40% decrease in column ozone over Antarctica in the spring season since the mid-1970's. Whether the recent changes in column and upper stratospheric ozone are due to natural phenomena or in part to CFCs remains an open question.

To limit column and upper stratospheric ozone depletions to less than the decadal natural variability reductions beyond a true global freeze may be required. A protocol that reduces emissions as much as 20-50 percent could fall short of a true global freeze since it will not include all chemicals, compliance in developed countries may be less than 100 percent, and substantial growth in CFC usage may occur in developing countries. If there is environmental damage due to CFCs and Halons their long

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atmospheric lifetimes would mean that recovery would take many decades even after complete cessation of emissions.

Coord. Bulletize the Health section. Get EPA & OSTP Pot'lly a Table

Health & Ecological Effects

Depletion of the ozone layer would result in increased penetration of biologically damaging ultraviolet radiation (UV-B) to the earth's surface. Based on the research completed to date, greater exposure to UV-B radiation has been linked to increases in the number of skin cancers and cataracts, suppression of the human immune response system, damage to crops and aquatic organisms, and increased formation of ground-level ozone (smog).

Based on epidemiological and ecological studies, dose-response relationshps were developed and reviewed as part of EPA's risk assessment. The extent of additional cancer deaths will depend on the degree of CFC control. If today's ozone level is maintained, the projected number of skin cancer deaths for White U.S. citizens born before 2075 (a total population of over 600,000,000) would be 3,000,000. If the ozone level is decreased by 26 percent, there would be a projected increase in the number of skin cancer deaths of 1,900,000 over the base of 2,100,000. For an ozone level decrease of 7.7 percent (the likely result of a protocol freeze), there would be an increase in skin cancer deaths of 300,000 over the case in which there was no ozone depletion. For an ozone level decrease of 6.1 percent (the likely result of a 20 percent reduction in emissions), there would be an increase in skin cancer deaths of 200,000 over the base. For an ozone level decrease of 3.2 percent (a 50 percent reduction), there would be an increase in skin cancer deaths of 100,000 over the base. This analysis assumes that exposure to sunlight (e.g., sunbathing) does not increase, that no major improvements in treatment of skin cancer occur, and that ozone depletion does not increase after 2100. The uncertainties in the total estimates of additional cases are due to uncertainties about the action spectra, predicted ozone depletion, and the dose-response co-efficients. There is a 90% probability that the actual cases will be between 20% and 260% of the estimated value, and a fifty percent probability that it will be between 50% and 125% as great.

Recent studies have also shown a strong dose-response relationship between UV-B and the incidence of cataracts. Approximately 12.5 million cases in the U.S. could be averted by a protocol freeze for the 600 million citizens born by 2075. A 50 percent reduction in the major CFCs would result in approximately 16.3 million cases averted. While laboratory studies link UV-B to suppression of the human response system with possible implications for increasing the incidence of herpes simplex and leishmaniasis, research into possible broader implications has not been undertaken and the quantitiative impact is not projected.

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Limited studies have examined the effects of increased UV-B radiation on plants and aquatic organisms. Five years of field studies of soy beans provide the most extensive data and suggest potentially large losses in yield for this species. Laboratory studies of UV-B effects on aquatic organisms show changes in community composition and reduced breeding season for phytoplankton and loss of larvae for higher order fish. Potential implications for the aquatic food chain have not been studied.

Put these in bullets

Cost/Benefit } Steve will bulletize

A cost benefit analysis has been performed for the projected skin cancer deaths, skin cancer non-fatal cases, and cataracts health effects projected from increased UV-B radiation occuring at the projected baseline growth of CFC emissions and at the levels of emissions contemplated by a protocol freeze of emissions, a 20 percent reduction thereof, and a further 30 percent reduction thereof. Such analysis involves substantial economic uncertainties and is not being presented with respect to the benefits derived from reducing the incidence of UV-B on plants, aquatic life, the human immune system, ground level ozone concentrations, polymer degradation, and global temperature because of the lack of sufficient quantitative experimental information. However, the benefits of these non-quantifiably evaluated benefits are acknowledged to exist and to be additive to the other benefits which were estimated.

Find tables to include? (mc + MB)

A range of assumptions was used in the analysis. The key variations in the assumptions were the valuations of lives saved (~~two million and~~ four million were used) and the discount rates for the costs and the benefits. Four percent and six percent were used for the benefits and the costs were evaluated at the same rate.

$

Sensitivity analysis was performed with respect to the economic valuation of lives saved and the growth in their value over time.

The uncertainties in the underlying data from which the individual health effects were calculated was not separately estimated. The central values for health effects from the EPA Risk Assessment Analysis were used in the cost benefit analysis. In order to bound the benefit assumptions by the uncertainty in the underlying health effects data, climate models, etc., the calculated benefits should be reduced or multiplied by a significant factor which could be as much as ____ percent.

The conclusions of the analysis are as follows:

--The benefits from a "protocol freeze" of the CFC emissions are substantially more than the costs over all plausible assumptions and ranges of uncertainty.

Define ≡ those parties to the protocol in draft

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--The aggregate benefits of a "protocol freeze" plus a 20 percent reduction in CFC emissions are also in almost all plausible cases substantially in excess of the costs.

--However, the marginal benefits of the additional 20 percent reduction beyond the freeze are not in all cases in excess of the marginal costs of the additional 20 percent reduction.

--The marginal costs of a further 30 percent reduction (beyond the freeze plus 20%) appear in some cases to exceed the benefits from a further 30 percent reduction. It is also true that in some cases examined the marginal benefits exceed the marginal costs for this incremental 30% step. Further scientific and economic review will be valuable before making the final decision on this step.

Add somewhere (i.e. health effects or particip) that all reduc scenarios are not useful if the LDCs are not brought in. -- Atmospheric → Counter: ① some bene's w/o LDC's & ② if Protocol exists, the LDCs are likely to join b/c substit's will exist & ③ trade provisions will exist.

ISSUES AND DISCUSSION

At the May 20, 1987 DPC meeting, the head of the U.S. delegation to the international ozone negotiations provided an overview of the progress and the status of the negotiations. DPC guidance to the U.S. negotiators is now sought on the following issues.

A. THE INTERNATIONAL NEGOTIATION PROCESS

Should any changes be made to the Circular 175?

The November 28, 1986 Circular 175 authorized the U.S. delegation to negotiate a protocol providing for:

I. A near-term freeze on the combined emissions of the most ozone-depleting substances;

II. A long-term scheduled reduction of emissions of these chemicals down to the point of eliminating emissions from all but limited uses for which no substitutes are commercially available (such reduction could be as much as 95 percent), subject to III; and

III. Periodic review of the protocol provisions based upon regular assessment of the science. The review could remove or add chemicals, or change the schedule or the emission reduction target.

Pro's:

* Diplomatic considerations favor continuing with the

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existing Circular 175. The U.S. position, as reflected in the 175 has been presented in formal negotiating sessions, congressional testimony and public position papers.

* The Circular 175 provides a general framework for a potential protocol and allows for various alternative approaches to the specific provisions of a control protocol.

Con's:

* As the negotiations move toward closure, the Circular 175 could be revised to specify the essential elements of a potential protocol from the U.S. perspective.

* The existing Circular 175 was not reviewed or approved by the highest levels in the inter-agency process.

① freeze
② reduc's beyond a freeze

B. AN EMISSIONS CONTROL PROTOCOL

wk. from Chairman's Text & make jmts from there.

In accordance with the existing Circular 175, the following questions are under consideration in the ongoing international negotiations. These questions relate to the potential emissions control provisions to be included in a protocol.

The first series of questions relates to the freeze on emissions described in the Circular 175. The questions under consideration with respect to a freeze are:

b. switch 1+2

When should a freeze on emissions occur? → -argmts saying that staying w/ Chmn's text 1 yr; or even earlier, 1 yr.

at 1986 levels

The Working Group consensus is that a freeze on emissions should go into effect two years after entry into force of the protocol. The anticipated entry into force is 1988; thus the freeze would go into effect in 1990.

↳[uncertainty as to when EIF will be]

Ref. what Chairman's text incl's

① What chemicals should the freeze cover?

-but also argmts for waiting -- i.e. small per's purchasers (consumers)

The Working Group consensus is that the freeze should include CFCs 11, 12, 113, 114, 115, and Halons 1201 and 1311.

-B, if not accurate

Add issue: Coverage shld be aggregate -- see NASA text.] for all reduc's that will hurt Consumers ↓ p's will not increase that much $200,000,000/yr.

2 - Reduc's Beyond Freeze

The next series of questions pertains to the emissions reductions beyond a freeze. The questions currently under consideration relate to the timing and extent of any such reductions, the chemicals to be included in such reductions, and whether such reductions should occur automatically or be tied to the future

↘ 2/3

both tied ↙ Contin.

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scientific and technological assessments provided for in the Circular 175.

b. How much and when?

The Chairman's text provides for a 20% reduction to take effect 4 years after entry into force (1992) and a 30% reduction to take effect either 6 years (1994) or 8 years (1996) after entry into force.

c. Should the reductions be automatic or tied to future science reviews? (R's pt.)

The Chairman's text provides for the initial 20% reduction to take effect automatically. The text provides two alternative implementing mechanisms for the next 30% reduction -- either an automatic reduction 6 years after entry into force, or, a 30% reduction 8 years after entry into force if affirmed by a majority vote of the parties.

a. What chemicals should the reductions cover?

The Working Group consensus is that any additional reductions should cover CFCs 11 and 12. There are questions about the coverage of CFCs 113, 114, 115, and Halons 1201 and 1311. National security concerns ~~favor~~ not including the Halons in any of the reductions beyond a freeze. There is also a national security concern with including CFC 113 in any reductions beyond a freeze, especially given 113's importance ~~to the semi-conductor industry~~ for certain high-tech elec applics. The questions regarding coverage of CFCs 114 and 115 concern their potential use as substitutes for controlled chemicals.

A. PARTICIPATION AND TRADE PROVISIONS

There remain many complex issues to be addressed in the international negotiations pertaining to fair trade provisions and the participation of developing countries. The following issues are under consideration:

1. Should the U.S. delegation seek maximum participation in the control protocol?

The U.S. and the United Nations Environment Program have expended considerable effort (e.g. through our Embassies and through paying travel costs) to encourage broad participation

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by developing countries. However, only relatively few have shown the interest or the expertise to participate. Parties to the protocol would not be able to prevent non-joining countries from producing CFCs for their internal market, but would be able to prevent them from profiting through international trade.

A strong protocol, including the major producing and consuming countries, could lead to earlier development of substitute products. This might discourage non-joiners from investing heavily in capacity in a soon-to-be obsolescent CFC technology. Further, the very existence of a protocol, as an expression of concern by the international community, increases the pressure on non-member countries to join; in essence, if they continue to produce CFCs, they are exposed as behaving irresponsibly on a matter of global import.

Some have rec'd that the U.S. develop a formula... DOI 2(b) + 3(f)

The Working Group consensus is that the delegation continue to negotiate for as broad a level of participation as possible.

add ¶ DOI 3(e) ¶

2. What should be the U.S. objective regarding voting among parties to the protocol?

The Working Group consensus is that the delegation negotiate for a system of voting which would credit the major producing and consuming countries.

3. What should be the U.S. objective regarding the control formula and trade provisions?

DOI 3c →

It is the consensus of the Working Group that the U.S. delegation seek to include in the protocol an effective formula to control emissions with accountability, the fewest possible restrictions on the flow of trade and capital among parties, the most favorable formula for U.S. industry, and strong monitoring and reporting provisions.

- wkg gp tackling this tough issue,
- it's impt.

Jan & Bob will provide input pts.

4. "Credit" — issue DOI 3(d))

5. DOI's 4 & 5

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QUESTIONS FOR DECISION

The DPC should decide, or should refer to the President for decision, the following issues concerning international stratospheric ozone negotiations

ISSUE I: Should the United States continue to participate in international negotiations of a protocol to control emissions of ozone depleting chemicals?

Working Group Recommendation: Yes.

ISSUE II: Should the DPC decide (or, with or without general guidance, refer back to the Working Group for prompt consideration and recommendation where none is indicated below) what the position of the United States should be on the issues set forth below during negotiation of an international protocol? As to each item not left to the sole discretion of the U.S. negotiators, should they be directed to insist upon, or merely seek acceptance of, the authorized U.S. position?

1. **Chemical coverage:**

Include CFCs 11, 12, 113, 114, 115 and Halons 1211 and 1301?

Working Group Recommendation:

2. **Country coverage:**

Should U.S. negotiators:

(a) Seek participation in an agreement by as many countries as possible, as determined by U.S. negotiators; or

(b) Insist upon, or seek, participation of countries in accordance with predetermined U.S. criteria, such as: specification of countries; a forumula which requires minimum participation by (i) countries which, in the aggregate, currently produce a specified percentage of total global CFC/halon production and (ii) countries which, in the aggregate, currently account for a specified portion of world population; countries identified by some other criteria or forumula?

Working Group Recommendation: Option ____ _____

3. **Freeze**

(a) Should U.S. negotiators seek a freeze on covered chemicals?

Working Group Recommendation: ____ _____

(b) If so, on what date should the freeze become effective?

Working Group Recommendation: _____

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(c) If there is a freeze, it should be based on each nation's:

(i) Production of covered chemicals for year 19__;

(ii) Consumption of covered chemicals for year 19__;

(iii) Production or consumption of covered chemicals for year 19__, whichever is higher; or

(iv) Some other specified factor for year 19__.

Working Group Recommendation: Option (___) for 19__

(d) If there is a freeze, should the United States (and the few other countries which followed the U.S. example) receive in some fashion "credit" for its 1978 unilateral, voluntary ban on CFC-producing non-essential aerosols (e.g., increase U.S. freeze level by all or a portion of the reduction in U.S. emissions which already have taken place, or require all participating nations to ban such aerosols and to freeze production or consumption at a level reduced by amount of emissions attributable to such aerosols)?

Working Group Recommendation: _____ _____

(e) Should certain nations, such as LDCs, be allowed to exceed the freeze level specified in (c)?

Working Group Recommendation: ____

(f) If so, U.S. position on which countries may be excepted from a strict freeze should be identified by which of the following criteria:

(i) Leave up to U.S. negotiators;

(ii) Inter-agency agreement in advance on specific criteria (such as GNP per capita as of given year, etc.) acceptable to United States; or

(iii) Inter-agency agreement in advance on certain countries which, notwithstanding criteria identified pursuant to (ii), should not be excepted from a strict freeze (such as certain countries with emerging ability to compete with U.S.)?

Working Group Recommendation: Option(s)____

(g) If some countries are to be excepted from a strict freeze, the U.S. position on the permissible annual rate of growth of CFCs/halons over what otherwise would have been the freeze level for each such country and the time period during which such growth should be permitted, should be:

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(i) Left up to U.S. negotiators; or

(ii) Established in advance by inter-agency agreement (e.g., permit growth by excepted countries until, say, year 2000 in an amount which, assuming 80% global adherence to a freeze, will eliminate need for emissions reductions beyond a freeze)?

Working Group Recommendation: Option ____

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4. **Should the U.S. negotiators insist upon or seek protocol provisions providing for reporting, monitoring and verification of compliance with a freeze:**

(a) Acceptable to the U.S. negotiators; or

(b) In accordance with guidelines established by inter-agency agreement which are designed to assure mutuality of compliance and which do not place unfair burden (financial or otherwise) on the United States to police compliance by others?

Working Group Recommendation: Option _____

merge w/4 →

5. **Enforcement provisions:**

(a) Should the protocol permit a party to withdraw from the protocol in the event of material breach by one or more other parties of its/their protocol obligations?

Working Group Recommendation: ____

(b) If withdrawal is a permitted remedy, should the circumstances in which it is permitted be:

(i) Left up to U.S. negotiators; or

(ii) In accordance with guidelines established by inter-agency agreement (such as not requiring vote of other parties to enable withdrawal)?

Working Group Recommendation: Option ____

(c) Should the protocol provide for imposition of trade sanctions against the export of products containing covered chemicals by countries, which:

(i) Are not parties to the protocol;

(ii) Are in material breach of obligations under the protocol; or

(iii) Both?

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Working Group Recommendation: Option ____

(d) If the protocol should provide for trade sanctions, should the U.S. position on issues such as whether trade sanctions should be permissive or mandatory, and whether trade sanctions should be capable of being imposed (or not imposed) according to decision of each party or only pursuant to vote of the parties to the protocol, be:

(i) Left up to the U.S. negotiators; or

(ii) In accordance with guidelines established by inter-agency agreement?

Working Group Recommendation: Option ____

6. **Relationship between science reviews and reductions beyond freeze:**

Should international science reviews be conducted:

(a) As now proposed by the negotiators: in 1990 (before the freeze becomes effective); in 1994 (the year in which the proposed 20% further reduction likely becomes effective); and in 1998 (the first year in which the second proposed reduction of an additional 30% might become effective); or

(b) On such different or additional date(s), following the year(s) in which the freeze and/or further reduction become effective, which is/are selected, among other things, to enable adequate assessment of the consequences of the freeze and/or further reduction?

Working Group Recommendation: Option ____

7. **Further reduction: Should the United States:**

(a) Agree now to one or more scheduled or targeted reductions in emissions beyond a freeze;

(b) Agree now to seek by negotiation, commencing within specified times following completion of international reviews of pertinent scientific, technological, health and economic information, such future emissions reductions beyond a freeze as are believed necessary in light of such reviews; or

(c) Defer to later date a commitment to seek negotiation of future emissions reductions beyond a freeze?

Working Group Recommendation: Option ____

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8. **If Option 7(a) is selected, first scheduled reduction issues** (this issue is not to be considered if Option 7(b) or (c) is selected):

(a) Should the United States agree now that there will be a first scheduled reduction following a freeze in the amount of:

(i) 20% below freeze levels;

(ii) Some other percentage selected by inter-agency agreement; or

(iii) None?

Working Group Recommendation: Option _____

(b) Such reduction, if any, should become effective:

(i) Automatically, unless a 2/3 vote of parties to protocol decides otherwise;

(ii) Only upon affirmative vote of:

(A) Majority of parties to protocol; or

(B) Super-majority (e.g., 2/3) of parties to protocol?

Working Group Recommendation: Option _____

(c) Should the U.S. negotiators insist upon or seek a voting system:

(i) Acceptable to the U.S. negotiators;

(ii) Designed to give voting weight reflective of each party's current production or consumption of covered chemicals, or otherwise protective of U.S. interests:

(A) As determined by the U.S. negotiators; or

(B) In accordance with guidelines established by inter-agency agreement?

Working Group Recommendation: Option _____

(d) Such reduction, if any, should be scheduled to occur:

(i) Four years after protocol entry into force (i.e., in 1994)

(ii) On a date following the voting specified in Issue 8(b), which is identified by inter-agency agreement as being adequate to enable appropriate adjustment by producers and consumers of covered chemicals?

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Working Group Recommendation: Option _____

(e) If 20% reduction, it should apply to:

(i) CFCs 11, 12, 113, 114, 115 and Halons 1211 and 1301;

(ii) Exclude Halons; and/or

(iii) Exclude CFC 113?

Working Group Recommendation: Option(s) ____ Insist.

(f) Insofar as this reduction is concerned, should the U.S. position on issues 3(d) through (g):

(i) Remain unchanged; or

(ii) Be modified, and, if so, in what respects?

Working Group Recommendation: Option _____ _____

9. **If Option 7(a) is selected, second scheduled reduction issues** (this issue is not to be considered if Option 7(b) or (c) is selected):

(a) Should the United States agree now that there will be a second scheduled reduction following a freeze in the amount of:

(i) An additional 30% below freeze levels (i.e., a cumulative 50% below freeze levels);

(ii) Some other percentage selected by inter-agency agreement;

(iii) None?

Working Group Recommendation: Option _____

(b) Such reduction, if any, should become effective:

(i) Automatically, unless a 2/3 vote of parties to protoc decides otherwise;

(ii) Only upon affirmative vote of:

(a) Majority of parties to protocol; or

(b) Super-majority (e.g., 2/3) of parties to protoc

Working Group Recommendation: Option _____

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(c) Such reduction, if any, should be scheduled to occur:

(i) Eight to ten years after protocol entry into force (i.e., 1998 - 2000); or

(ii) On a date following the voting specified in issue 9(b), which is identified by inter-agency agreement as being adequate to enable appropriate adjustment by producers and consumers of covered chemicals?

Working Group Recommendation: Option _____

(d) Insofar as this reduction is concerned, should the U.S. position on issues 3(d) through (g):

(i) Remain unchanged; or

(ii) Be modified, and, if so, in what respects?

Working Group Recommendation: Option _____ _____

(e) If further reduction, it should apply to:

(i) CFCs 11, 12, 113, 114, 115 and Halons 1211 and 1301;

(ii) Exclude Halons; and/or

(iii) Exclude CFC 113?

Working Group Recommendation: Option(s) ____ Insist.

10. **If Option 7(a) is selected, third (or further) scheduled reduction issues** (this issue is not to be considered if Option 7(b) or (c) is selected):

(a) Should the United States agree now that there will be a third (or further) scheduled reduction following a freeze in the amount of:

(i) As much as 95% below freeze levels;

(ii) Some other percentage, limited by inter-agency agreement; or

(iii) None?

Working Group Recommendation: Option _____

(b) Such reduction, if any, should become effective:

(i) Automatically, unless a 2/3 vote of parties to protocol decides otherwise;

(ii) Only upon affirmative vote of:

(A) Majority of parties to protocol; or

(B) Super-majority (e.g., 2/3) of parties to protocol?

Working Group Recommendation: Option _____

(c) Such reduction, if any, should be scheduled to occur:

(i) On a date acceptable to U.S. negotiators; or

(ii) On a date following the voting specified in Issue 10(b), which is identified by inter-agency agreement as being adequate to enable appropriate adjustment by producers and consumers of covered chemicals?

Working Group Recommendation: Option _____

(d) Insofar as this reduction is concerned, should the U.S. position on issues 3(d) through (g):

(i) Remain unchanged; or

(ii) Be modified, and, if so, in what respects?

Working Group Recommendation: Option _____

discuss

ISSUE III: Should the Domestic Policy Council direct the Working Group to consider, and report back its recommendations concerning, a domestic non-regulatory plan which, **in addition to an international protocol**, might facilitate either (i) attaining the health and environmental objectives sought by the protocol or (ii) easing the burdens upon the citizens and economy of the United States resulting from compliance with the protocol, or both?

Such a domestic, non-regulatory supplement to the international protocol might, for example, contain elements intended to eliminate government barriers to, or to facilitate, the development of: substitutes for covered chemicals which are technologically and economically feasible and safe from health and environmental standpoints; technology to mitigate or eliminate the adverse effects of covered chemical emissions upon stratospheric ozone; and technology, medical procedures and treatment, and understanding of the population to mitigate or eliminate the adverse effects upon humans and the environment of excessive exposure to ultra-violet radiation.

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Reasons in favor of proposal:

- The overall objective of the protocol is the desire to avoid or to reduce health and environmental risks. There is no reason why the Nation's efforts to achieve that objective should be limited to a regulatory approach.

- Compliance with the international protocol necessarily results in domestic regulation. It is only fair for the government which imposes such regulatory burdens upon the people and the economy of the United States to consider policies which may ease the regulatory burdens, including, but not limited to, possibly rendering unnecessary imposition of regulations beyond those necessary to assure United States compliance with a freeze.

make stmt about linking

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