

SENATE ECOLOGY COMMITTEE

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Minutes of Meeting --- February 11, 1971

Committee members present: Thomas Wilson, Chairman
Chic Hecht
Coe Swobe
Lee Walker
John Foley
Clifton Young
" " absent: Emerson titlow

Also present were:

Roger G. Flynn	Air Transport Association
Robert Lusk	Trans-Western Airlines
Joe K. Hicks	Reno Municipal Airport
W. Howard Gray	Nevada Mining Association
N.J. Barnett	" " "
Dr. John M. Brophy	Nevada State Medical Assn.
B.W. Firth	Cars City resident
Mrs. Bruce Thompson	Reno resident
Janet MacEachern	League of Women Voters
Sonia DeHart	" " " "
Howard Clodfelter	Washoe Co. Dist. Health Dept.
Ira Kent	Nevada Cattlemen's Assn.
Fred Settlemyer	
Ray Kniseley	Nevada Farm Bureau
Louis Beirgen	Nevada Agriculture Council
Eleanor Brown	Zephyr Cove resident
E.L. Newton	Nevada Taxpayer's Assn.
Virginia Vogel	Lahontan Audubon Society
Ingrid Hanf	" " "
C.A. Soderblom	Nevada Railroad Association
Daryl Cappuro	Nevada Transport Association
Virgil P. Anderson	American Automobile Assn.
Edward Parsons	Reno resident (architect)
Tina Nappe	Foresta Institute
Lucy Needer	Reno resident

Members of the News Media

Chairman Wilson called the meeting to order at 2:05 p.m. He stated the purpose of the meeting was continued public hearing on S.B. 20 and S.B. 118 in addition to a new bill under consideration:

S.B. 39 Proposed by Senators Young, Hecht, Walker, Wilson and Foley.
Establishes noise-abatement procedures.

Testimony was taken from various witnesses as noted on following pages; however, no action was taken and the meeting was adjourned at 4:52 p.m.

S. B. 39

SENATE BILL NO. 39—SENATORS YOUNG, HECHT,
WALKER, WILSON AND FOLEY

JANUARY 25, 1971

Referred to Committee on Ecology

SUMMARY—Establishes noise-abatement procedures. Fiscal Note:
No. (BDR 40-247)



EXPLANATION—Matter in *italics* is new; matter in brackets [] is
material to be omitted.

AN ACT relating to noise pollution; establishing control and abatement procedures
for excessive noise; permitting organization of county advisory noise control
committees; providing civil and criminal remedies; providing a penalty; and
providing other matters properly relating thereto.

*The People of the State of Nevada, represented in Senate and Assembly,
do enact as follows:*

1 SECTION 1. Chapter 445 of NRS is hereby amended by adding
2 thereto the provisions set forth as sections 2 to 11, inclusive, of this act:

3 SEC. 2. *The legislature finds that excessive noise endangers physical*
4 *and emotional health and well-being, interferes with legitimate business*
5 *and recreational activities, increases construction costs, depresses property*
6 *values, offends the senses, creates public nuisances and, in other respects,*
7 *reduces the quality of our environment.*

8 SEC. 3. *As used in sections 4 to 11, inclusive, of this act, unless the*
9 *context otherwise requires:*

10 1. "Committee" means the county advisory noise control committee.

11 2. "Department" means the department of health, welfare and reha-
12 bilitation.

13 3. "Excessive noise" means sound which is injurious or which
14 unreasonably interferes with the comfortable enjoyment of life and prop-
15 erty in the state or in such areas of the state as may be affected thereby.

16 SEC. 4. *The department shall adopt such rules and regulations,*
17 *including standards of excessive noise relating to the various sources*
18 *thereof, for different areas of the state, as are necessary to prohibit or*
19 *control excessive noise caused by any person. No such rule or regulation,*
20 *or any amendment thereto, shall be effective until 60 days after the*
21 *adoption thereof and after the publication thereof in a newspaper of*
22 *general circulation in the area of the state affected thereby.*

23 SEC. 5. 1. *The department may organize a county advisory noise*

1 control committee in any county in which it determines that the estab-
2 lishment of such committee is advisable to assist it in carrying out the
3 purposes of sections 2 to 11, inclusive, of this act. The committee shall
4 consist of not more than seven members, a majority of whom shall not
5 be officers or employees of the state, county or Federal Governments.
6 They shall be appointed by the department and shall serve without
7 compensation but shall be reimbursed for expenses and allowed travel
8 expenses pursuant to NRS 281.160.

9 2. *The committee shall study excessive noise problems of the county,*
10 *and advise the department relative thereto.*

11 3. *All rules or regulations of strictly local application, before they*
12 *are adopted by the department, shall be submitted to the committee if*
13 *one has been appointed for the county affected, for discussion and, within*
14 *30 days after submission, a report thereon.*

15 SEC. 6. *If, after a hearing in accordance with chapter 233B of NRS,*
16 *the department determines that any person is violating this part or any*
17 *rule or regulation thereunder, the department may order that such person,*
18 *within a reasonable time fixed by the department, cease and desist from*
19 *such violation. The department may institute a civil action in any court*
20 *of competent jurisdiction for the enforcement of any such order.*

21 SEC. 7. *The department may institute a civil action in any court of*
22 *competent jurisdiction for injunctive relief to prevent any violation of this*
23 *part or any rule or regulation made thereunder.*

24 SEC. 8. *Any person who willfully and knowingly makes or causes to*
25 *be made any excessive noise in violation of sections 2 to 11, inclusive,*
26 *of this act or in violation of any rule or regulation of the department is*
27 *guilty of a misdemeanor.*

28 SEC. 9. *No existing civil or criminal remedy for any wrongful action*
29 *which is a violation of any rule or regulation of the department shall be*
30 *excluded or impaired by sections 2 to 11, inclusive, of this act.*

31 SEC. 10. 1. *All laws, ordinances, rules and regulations inconsistent*
32 *with sections 2 to 11, inclusive, of this act shall be void and of no effect;*
33 *but all laws, ordinances, rules and regulations relating to noise control*
34 *in effect on the effective date of this act shall remain in effect for any area*
35 *of the state with respect to which rules of the department adopted pur-*
36 *suant to sections 2 to 11, inclusive, of this act are not in effect.*

37 2. *No county shall adopt an ordinance, rule or regulation relating*
38 *to noise control after the effective date of this act.*

39 SEC. 11. *All county health authorities and peace officers shall enforce*
40 *the rules, regulations and orders of the department.*

Ⓢ

Transcription of testimony given February 11, 1971 by Brian Firth of Carson City, who said he is a consulting logician but was not representing any client at this hearing on SB-39.

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MR. FIRTH: I have specific objections to two sections of this act (SB-39). Firstly I object to section 8 and ask could it be stricken.

We have heard what the noise is, to which the act applies, are made by people operating engines and people playing musical instruments. These people are not commonly thought of as criminals. I submit that if the Legislature is to declare this kind of thing a crime, two different adverse affects can be seen.

First of all, if an activity, which is today innocent, can be made a crime tomorrow, there is going to be very severe political strife, indeed. No one will be able to allow his political enemies access to political power.

The airlines, for instance, would be exceedingly upset in case the truckers and railroads dominate the Legislature. And secondly_____

CHAIRMAN WILSON:Could you try that again?

MR. FIRTH: The noises, judged from the witnesses, which would be affected, are those made by people operating engines and people playing musical instruments.

Normally we do not think of such people being criminals. If the Legislature is going to say, that from now on, these acts which were innocent yesterday shall be a crime, then, there is going to be consequences. One of the consequences will be political strife. If you can make the operation of some particular aircraft, a crime, the airlines will be afraid of seeing the railroads and trucking lines sominating the Legislature.

CHAIRMAN WILSON: ...That's the point I didn't understand.

MR. FIRTH: Well, if you make the business of some minority, a crime, that minority would go in fear of its existence, sir.

CHAIRMAN WILSON: Isn't that always the case, Mr. Firth? Its not a crime to drive an automobile, but it is a crime to drive over the speed limit. Isn't that the case no matter when you pass a law, you attach a penalty and might create a criminal of some sort?

Mr. Firth: I supposed sir, that the reason we have a constitution, was to particularly establish that the people had certain rights which were beyond cabal and beyond question.

CHAIRMAN WILSON: Don't you think that people have a right to be free from noise pollution and there should be laws insuring their protection and the offenders penalized?

MR FIRTH: And take the consequences, sir, and take the consequences. We see here that there are civil remedies and I entirely agree there must be a civil remedy.

MR. FIRTH: I submit that there should be allowability for damages but it should not be a misdemeanor.

CHAIRMAN WILSON: Isn't this just a matter of governmental philosophy? You think that the maintenance of basic health standards are solely a civil matter which the offended person sues for damages or do you think normal regulatory and police power of the government ought to apply? If that's what you are questioning...then we'll proceed on that basis.

MR. FIRTH: Yes sir I'm ready so to do. I would hold that in a republic, the state exists for law and order and exists for protection against foreign enemies and against domestic criminals. Even Mr. Justice Holmes, I submit, was never quite able to discover this police power. He said a police power must somewhere be found, but I've never heard that the police power is there. I notice California Jurisprudence Two refers to the 'so-called police power'

CHAIRMAN WILSON: How would you have health standards supported?

MR. FIRTH: In the market place, sir, in the orthodox way...It would mean that if you damaged somebody's health, you would be liable for damages.

CHAIRMAN WILSON: After the fact?

MR. FIRTH: Of course, sir.

CHAIRMAN WILSON: Suppose you knew about the _____ damage before it occurred?

MR. FIRTH: Presumably, sir, the intelligent individual, whose fortune is at stake will not care to risk it.

CHAIRMAN WILSON: We have your views on that point. What else do you want to object to...in respect to the bills.

MR. FIRTH: I also object to Section 4. May I point out on line 18, the words 'for different areas of the state' again, if I correctly understand a republican form of government, a state legislature is confined to writing laws which apply throughout the state. We know full well, even this house of the legislature is elected on a population basis and not on an area basis. It can perfectly well happen, it has happened in California, that one city controls the state legislature. Submitted, this would not be...this state of affairs would be unacceptable, if a legislature could write laws which differ from one place to another within the state.

CHAIRMAN WILSON: Do you recognize in Section 4 that, within the jurisdictional provisions...would authorize the state board of health to draw and promulgate regulations that one kind may be required in one area, say an urban area, and another kind might be required in another area, like an agricultural district?

MR. FIRTH: I recognize that full well, sir, but it appears to me that, submitted sir, there are two questions here: One, can this legislature write laws which differ from place to place? If it can, can it then delegate this power to any other body? I am, at the moment, speaking only to the first question. Can the laws differ from place to place? I hold that under a republican form of government, they may not.

SENATOR HECHT: I did not understand what you said is your occupation?

MR. FIRTH: I am a consulting logician, sir.

SENATOR HECHT: What is a logician?

MR. FIRTH: I specialize in just such questions as this sir, what acts are consistent with a republican form of government and what acts are not consistent with a republic form of government.

CHAIRMAN WILSON: How does one make one's living being a logician?

MR. FIRTH: Will you allow me another year or two to answer that question, sir?

SENATOR HECHT: We'll probably be here.

SENATOR WILSON: There aren't many logicians in the ranks of this legislature and perhaps that's why we were having difficulty understanding. You imagine that you can't have different rules for different areas, is that right, sir?

MR. FIRTH: Can I find it slightly different sir? The legislature may not write different rules for different areas, it might happen that the courts held that a certain amount of noise was actionable in this place and in another place, the courts held that a different noise was actionable.

SENATOR YOUNG: Of course, we're not writing the rules here that are different for different areas, you understand that, don't you sir? Our rules will apply state-wide...only the regulations might be developed to apply to different areas. Isn't this what zoning is, to a large extent? Different rules for different areas?

MR. FIRTH: I trust, sir, you'll agree, that zoning laws are particularly examples of laws which give severe rise to political controversy.

SENATOR YOUNG: Lack of zoning laws would give even greater rise to political difficulties.

MR. FIRTH: I daresn't to say sir, that the Keynesian economists and sociologists, and political scientists would not agree with you. Most of them hold that the 'market place' is a way for reconciling differences of value, without conflict or argument.

SENATOR HECHT: We might advise you we're writing laws everyday which apply to different standards throughout the state. Some for counties population of 100,000, over and under. We're constantly writing different laws, for different effects in different areas.

MR. FIRTH: Well, sir, if you're giving me license to comment, I will point out that at the present time, the United States Dollar is becoming less and less valuable, with every month that passes. This isn't universally agreed, submitted, to be due to bad government.

The liberals and conservatives on one hand say, it is caused by government intervention in industry. And the Keynesian economists on the other hand say, a government should be able to prevent inflation. So it seems that every part of the political spectrum, from the ultra-conservatives to the Keynesians, all agree if there is inflation, there is bad government.

end of verbatim testimony.

MRS. BRUCE THOMPSON of Reno asked the members if something could be done through SB-39 that would prohibit unsolicited telephone advertising in the home. She said she considers such calls as noise pollution. She stated she had complained to the Better Business Bureau in Reno but was advised there was nothing it could do and referred her to this committee, for possible action.

2-11-71
RNO OPI RLA
CHIEF RNO STN. PLEASE HAND DELIVER TO THE FOLLOWING INDIVIDUAL.

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MR. JOSEPH K. HICKS
AIRPORT MANAGER RENO MUNICIPAL AIRPORT
POST OFFICE BOX 1900
RENO NEVADA 89502

OUR ANALYSIS OF NEVADA/S SENATE BILLS 20 AND 39 AND SENATE JOINT RESOLUTION NO. 4 IS AS FOLLOWS
SENATE BILL 20 WOULD ESTABLISH NEVADA POLICY IN REGARD TO ENVIRONMENT BY ADOPTING THE ENVIRONMENTAL QUALITY ACT OF 1971. IT DOES NOT APPEAR TO CONFLICT IN ANY WAY WITH THE FEDERAL POLICY CONTAINED IN THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 ADOPTED BY CONGRESS AS PUBLIC LAW 91-190. ALSO IT DOES NOT APPEAR TO CONFLICT WITH THE ENVIRONMENTAL REQUIREMENTS IN SECTION 16 OF THE AIRPORT AND AIRWAY DEVELOPMENT ACT OF 1970 ADOPTED AS PUBLIC LAW 91-258. IN FACT BY COMPLYING WITH SECTION 16 THE SPONSORS UNDER ADAP IN NEVADA WOULD BE IN EFFECT BE COMPLYING WITH THE NEVADA ENVIRONMENTAL POLICY ACT IF ADOPTED. THE ENABLING CONSTITUTIONAL AMENDMENT SET FORTH IN SENATE JOINT RESOLUTION 4 DOES NOT APPEAR TO BE OBJECTIONABLE.
WE WOULD OPPOSE SENATE BILL 39 OR IN THE ALTERNATIVE ASK THAT AN EXCEPTION BE WRITTEN INTO THE BILL TO EXEMPT AIRCRAFT OPERATIONS.
SENATE BILL 39 AS PRESENTLY PROPOSED WOULD GIVE THE NEVADA DEPARTMENT

PART TWO OF THREE PARTS

OF HEALTH WELFARE AND REHABILITATION AUTHORITY TO ADOPT RULES AND REGULATIONS IN REGARD TO EXCESSIVE NOISE REGARDLESS OF THE SOURCE. FEDERAL COURT DECISIONS SUCH AS CEDARHURST COMMA HEMPSTEAD COMMA CITY OF BURBANK AND CITY OF AUDOBON PARK CLEARLY HOLD THAT STATES COMMA COUNTIES COMMA OR LOCAL GOVERNMENTS CANNOT REGULATE AIRCRAFT NOISE WHEN SUCH REGULATION INVOLVES THE CONTROL OF FLIGHT OF AIRCRAFT. THERE ARE THREE BASIC LEGAL CONCEPTS WHICH ARE AS FOLLOWS
1. PRE-EMPTION OF THE FIELD BY FEDERAL LAW
2. CONFLICT WITH FEDERAL LAW THEREBY VIOLATING THE SUPREMACY CLAUSE OF THE CONSTITUTION OF THE UNITED STATES AND
3. IMPEDING THE FREE FLOW OF COMMERCE THEREBY VIOLATING THE COMMERCE CLAUSE OF THE CONSTITUTION.

SECTIONS 307 AND 411 OF THE FEDERAL AVIATION ACT AS AMENDED BY CONGRESS CLEARLY GIVE THE ADMINISTRATOR THE FEDERAL AVIATION ADMINISTRATION AUTHORITY TO REGULATE THE SAFE AND EFFICIENT USE OF THE AIRSPACE AND TO PRESCRIBE RULES AND REGULATIONS FOR THE CONTROL AND ABATEMENT OF AIRCRAFT NOISE AND SONIC BOOM. THE LEGISLATIVE HISTORY OF PUBLIC LAW 90-411 ADOPTED BY CONGRESS IN 1968 INDICATES THAT

AIRPORT PROPRIETORS MIGHT REFUSE NOISIER AIRCRAFT. IN DOING SO HOWEVER THE LEGAL CONCEPTS OF RE-EMPTION COMMA CONFLICT COMMA AND FREE FLOW OF COMMERCE STILL APPLY AND THE

PART 3 OF 3 PARTS

AUTHORITY OF THE AIRPORT PROPRIETOR IN EXERCISING POLICE POWER CANNOT BE VIOLATIVE OF THESE BASIC LEGAL CONCEPTS. HOWEVER THERE HAVE BEEN NO AUTHORITATIVE JUDICIAL RULINGS TO DATE. WHILE NONE OF THE AFOREMENTIONED NEVADA BILLS APPEAR TO COVER AIRCRAFT SMOKE EMISSIONS THERE MIGHT BE SUCH A BILL UNDER CONSIDERATION BY THE LEGISLATURE. IF SO PLEASE ADVISE THE COMMITTEE THAT PUBLIC LAW 91-504 KNOWN AS THE CLEAN AIR AMENDMENTS OF 1970 SIGNED BY PRESIDENT NIXON ON 31 DECEMBER 1970 CLEARLY PRE-EMPTS THE FIELD OF AIRCRAFT AIR POLLUTION EMISSIONS STANDARDS. IN FACT CMA SECTION 233 OF THAT LAW PROVIDES THAT NO STATE CMA CITY CMA OR PUBLIC SUBDIVISION MAY ADOPT OR ATTEMPT TO ENFORCE ANY STANDARDS RESPECTING EMISSIONS OF ANY AIR POLLUTANTS FROM ANY AIRCRAFT OR ENGINE UNLESS SUCH STANDARD IS IDENTICAL TO THE FEDERAL STANDARD. IT IS SUGGESTED THAT YOU CALL THIS TO THE ATTENTION OF THE COMMITTEE. YOU ARE AT LIBERTY TO PROVIDE THE COMMITTEE WITH A COPY OF THIS TELEGRAM.

NED K. ZARTMAN
REGIONAL COUNSEL
WESTERN REGION
FEDERAL AVIATION ADMINISTRATION.

ZARTMAN WE-7 102004

TO: Committee on Ecology, Nevada State Senate

SUBJECT: Senate Bill #39

The Washoe County District Health Department is in full accord with noise control legislation.

Noise does have specific effects on human beings, such as hearing loss, psychological effects, also physical effects.

The effects of noise on your person can largely be alleviated or prevented and should be.

I am sure that there will be opposition to this bill as there has been to all ecology bills that have been considered during this session. But almost invariably, it is either from uninformed ~~citizens~~ good citizens, or self-serving opposition from specialized interest.

We all hear that we must wait on the control of our environment or let Federal government do it. We are well past the era of mere suspicion that noise, air and water contamination is a menace to human health. Over one hundred years ago, public health officials suspected that filth and certain communicable diseases were related. Thus, long before development of the science of bacteriology, efforts were made to alleviate disease by eliminating filth.

The real issue is whether life in our communities will be possible and worth living for our children if something is not done today.

Is this our future? The Air Chokes! the Noise Hurts! The Water Smells!

As the representative of the Washoe County District Health Department we recommend the adoption with two minor amendments.

SECTION 5 PARAGRAPH 1 - The department may organize a county advisory noise control committee in any county in which it determines that the establishment of such committee is advisable, or upon the recommendation of a district, county or city board of health, to assist it in carrying out the purposes of sections 2 to 11, inclusive, of this act. The committee shall consist of not more than seven members, a majority of whom shall not be officers or employees of the state, county or Federal Governments. They shall be appointed by the department and shall serve without compensation but shall be reimbursed for expenses and allowed travel expenses pursuant to NRS 281.160.

AMEND SECTION 10, PARAGRAPH 2 to read: The district board of health, governing body of any county or city may adopt laws, ordinances, rules or regulations which are more restrictive than rules and regulations adopted pursuant to sections 2 to 11, inclusive of this Act.

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AIR TRANSPORT ASSOCIATION OF AMERICA

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1000 CONNECTICUT AVENUE, N. W. • WASHINGTON, D. C. 20036 • Telephone 296-5800

RECEIVED - LAXGO

JUN 9 1970

June 4, 1970

Bill Bell

TO: Attendees - ATA Seminar on Aircraft Noise and Pollution -
May 26, 1970

During the ATA Seminar on Aircraft Noise and Pollution, reference was made to several items which it was agreed would be forwarded to you. These are enclosed for your information and use.

Clifton F. von Kann
Vice President - Operations & Engineering

Attachments

Excerpt From
ICAO Special Meeting on Aircraft Noise
in the Vicinity of Aerodromes
Montreal, 25 November 1969

Final Report on Agenda Item 4

4.5 Whilst it was recognized that the subject of "curfew" came within the ambit of the overall theme of the Meeting, it was agreed that it was scarcely appropriate to an agenda item dealing with the development of criteria for the establishment of noise abatement operating procedures. It was also recognized that curfews represent one of the means to reduce (or indeed to eliminate) aircraft noise disturbance at night which was best understood by the general public. The Meeting acknowledged that the imposition of curfews (i. e. the restriction of operations between certain hours) had apparent advantages for communities in the vicinity of aerodromes that were immediately noticeable and appreciated, as well as fostering understanding and sympathy of the communities with airport operations, and in the long run, encouraging commercial air transport. However, there might be substantial disadvantages to the communities whose transportation systems greatly depend on the particular airports concerned.

4.5.1 Attention was drawn to the fact there was a vast difference in the economic impact of full and partial night-time curfews. For instance, a selective curfew, limiting the use of a single runway or use of the aerodrome to particular aircraft types and/or aircraft of certain gross weight, would have a far less serious economic impact than a complete night-time embargo. Among the actual disadvantages which might occur from night-time curfews the following were highlighted:

- i) the concentration of noise annoyance to periods immediately prior to and following the curfew period;
- ii) the cancellation of some flights due to unavoidable delay and serious difficulties in scheduling;
- iii) the reduction of service available to passengers, mail and cargo;
- iv) public deprivation of cheaper night fare rates;
- v) the loss of business to the community in general;
- vi) consequent restrictions on scheduling at other aerodromes;
- vii) increased noise at other aerodromes.

FIGURE 16
TIMING COMPATIBILITY
 RETIREMENT AT END OF 12TH YEAR
 DC-8-50/61 AIRPLANES

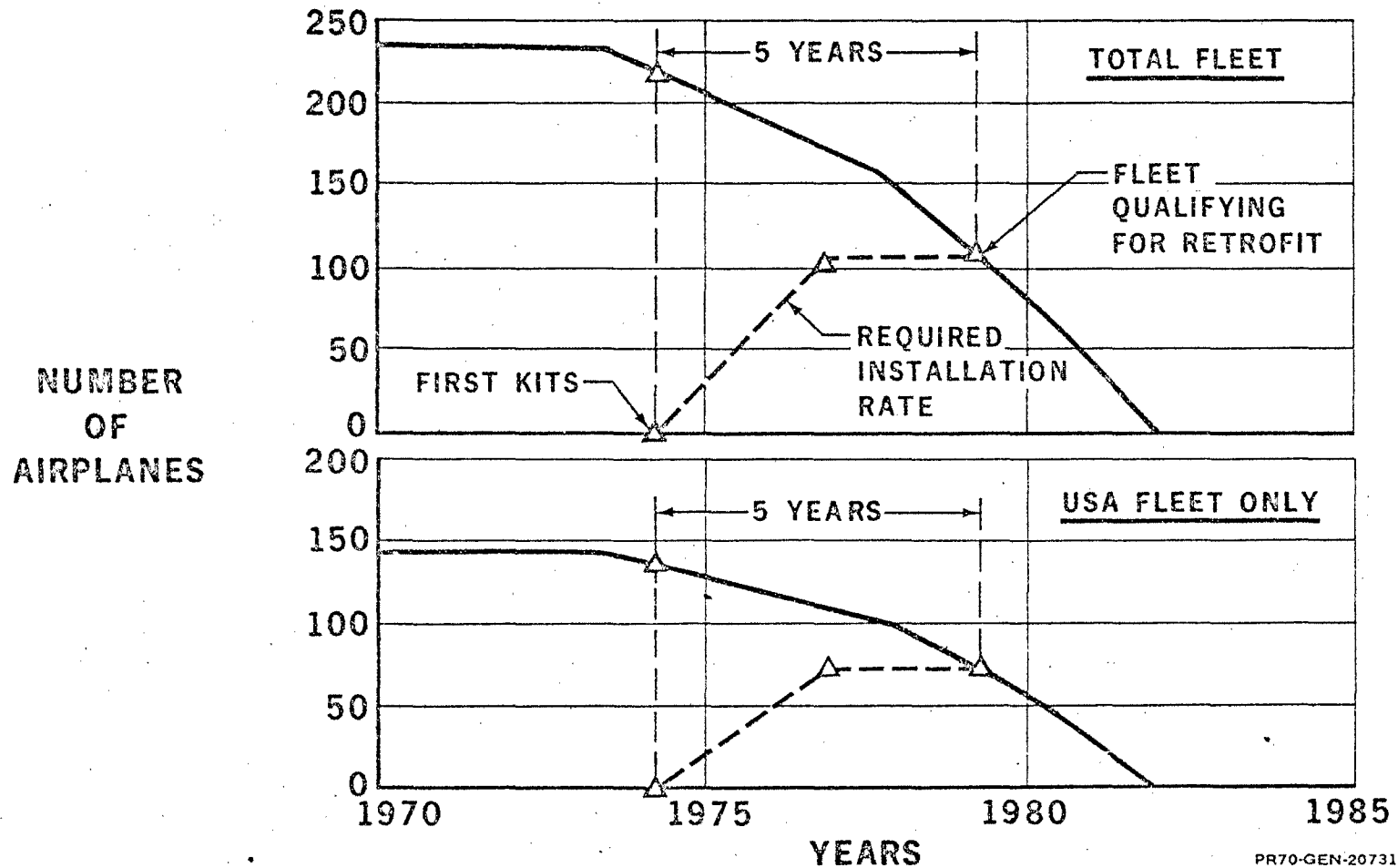
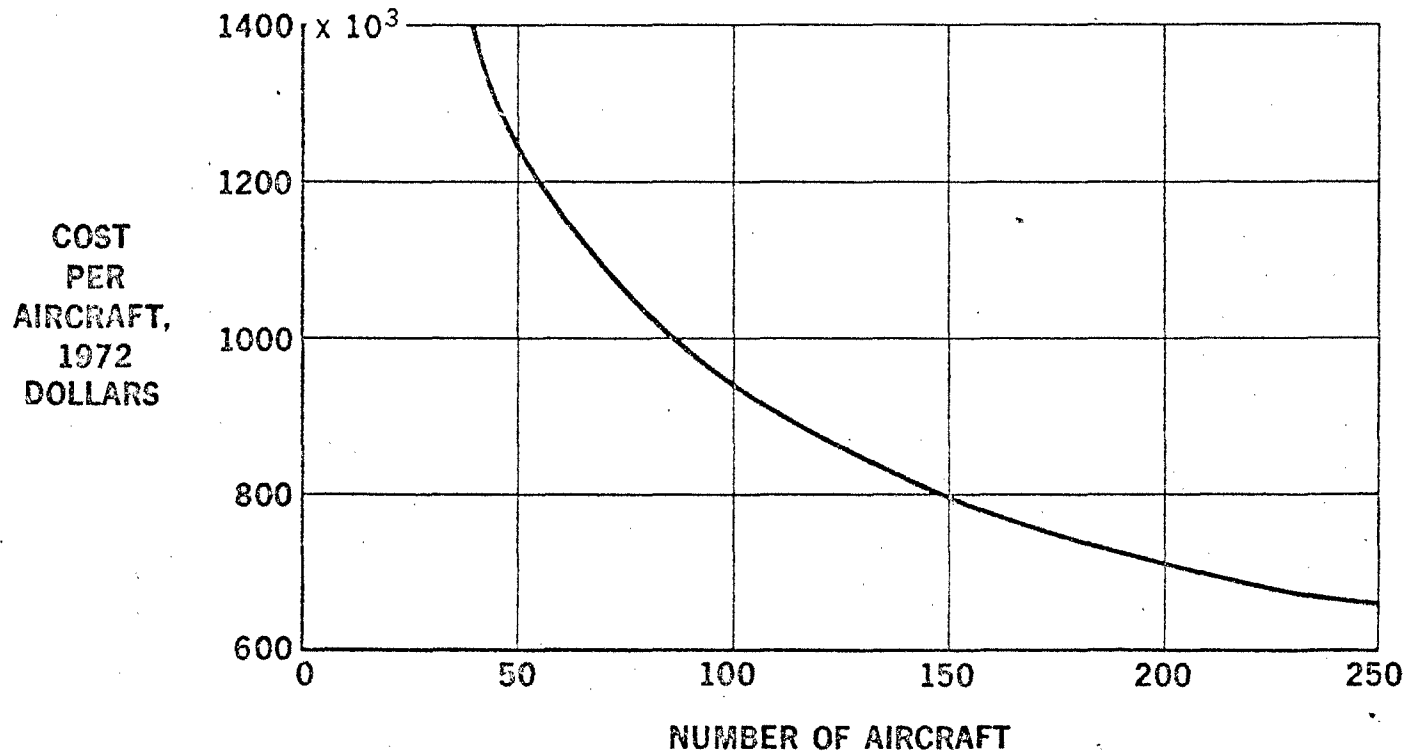


FIGURE 17

ESTIMATED KIT COSTS
NASA ACOUSTICALLY TREATED NACELLES
SHORT DUCT DC-8 AIRPLANES; 20% SPARES





DEPARTMENT OF TRANSPORTATION

NEWS

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FEDERAL AVIATION ADMINISTRATION WASHINGTON, D. C. 20590

SST FACT SHEET

THE UNITED STATES SUPERSONIC TRANSPORT

(Environment)

In full-page advertisements in major newspapers, the Friends of the Earth recently charged the SST with "hastening the end of the American wilderness" and, by means of its sonic boom, causing distress to people and damage to property. That the full facts may be known, we have prepared the following response, based on information documented before the Congress of the United States.

The Supersonic Transport and Sonic Boom

- Any aircraft flying faster than the speed of sound within the atmosphere will produce a phenomenon known as a sonic boom. Booms are not of a uniform character, in sound or intensity, and will vary substantially depending on the nature of the vehicle, its shape, size, weight, speed, and altitude; the "attitude" of flight (level or dive); atmospheric conditions; and even the topography under the aircraft.
- Military aircraft have been flying at supersonic speeds for 25 years, yet relatively few people understand the nature of sonic booms. Severe sonic booms that have occurred are best described as sonic boom "accidents" except for those generated deliberately during sonic boom tests. Severe booms occur when the aircraft generating them are flying at low altitudes, a few hundred feet. The SST will not fly supersonically until high altitudes, over 36000 feet are reached, hence the intensity of its booms will be relatively small.
- Sonic boom intensities are measured in pounds per square foot of overpressure, meaning pressure in excess of the atmospheric normal. Sonic boom research conducted since 1958 has identified the range of intensities that must be reached to cause damage to buildings. These are above the intensities predicted for the U.S. Supersonic Transport. (The U.S. SST will average a boom signature of 2.0 psf or less during the long cruise phase of its flight.) Severe booms of the "accident" category can range from 20 to 120 psf. During tests of severe booms, 120 psf, people subjected to them were not injured.

- Nevertheless, even booms of low intensities are assumed to be unacceptable to the general public. We have taken this position since 1967, and all of our economic and technical decisions have been based on our assumption that flights at boom-producing speeds will not be permitted over populated areas. This position has been confirmed by the President of the United States, the Secretary of Transportation and the Administrator of the Federal Aviation Administration, and is clearly the desire of the Congress.
- The airways are governed by Federal Air Regulations, made in the public interest and subject always to public hearings. A Federal Air Regulation is now in the making which will prohibit the operation of civil supersonic aircraft over populated areas at speeds that would cause a sonic boom to reach the ground. This regulation will be binding on the U.S. SST and the supersonic transports of other nations operating in our airspace.
- Federal Air Regulations are written or revoked, not at the whim of the Administration or by the mood of the Congress, but in compliance with the public interest. The regulation now being developed will, in effect, serve to ban boom-producing flights over populated areas.

The Sonic Boom and the Oceans

- With regard to the possible effect of supersonic transport sonic booms on marine life, Dr. John C. Calhoun, Chairman of the National Academy of Sciences Committee on Oceanography, has stated that: "A substantial amount of work has been done on the effects of explosions in the air, which demonstrate clearly that acoustic energy is transmitted very inefficiently from the atmosphere to the ocean. The results of other experiments on attempts to influence fish acoustically have been trivial if detectable."
- A special report to the Secretary of the Interior, prepared by a committee appointed by him, indicates that it seems unlikely that the pressure from sonic booms would have any effect on aquatic life, especially since "the overpressure from sonic booms are much less than the difference in pressure between the top and the bottom of a small ocean wave."
- For more than ten years, military aircraft have been conducting extensive supersonic operations off the East and West coasts of the United States, and over ocean areas elsewhere throughout the world. To our knowledge, no Government agency has received any sonic boom complaints or damage claims resulting from those operations.

The Sonic Boom and Animal Life

- The results of tests on human and animal responses to sonic booms have been of limited value and point out the need for continued research.

- As of July 31, 1969, 18 separate programs investigating the sonic boom and its effects were under way. The fiscal year 1970 FAA budget includes \$1 million for sonic boom research, including the investigation, studies and determination of sonic boom affecting (1) generation and propagation, (2) human response, (3) animal response, and (4) glass damage criteria.

The President's Ad Hoc SST Committee

- The President did not convene a committee of Administration officials "to advise him concerning whether he should cancel the whole SST project." The President did seek counsel on the issues at stake in continuing the program, and an accounting of the challenges at hand.
- Actually, none of the committee members recommended termination of the program, although some advocated more study.
- The matters of concern expressed in the committee's findings were neither new nor unfamiliar. The questions the committee members posed revolved around the uncertainties associated with the program all of which have been studied and examined many times during the nine years the SST program has been under way. The most significant reservation voiced by the committee, that of sonic boom, is being handled by the Government in a way that will safeguard people and property.
- "Prestige" is not an issue; America's aviation leadership is. We do not advocate the SST for reasons of prestige, but for the purposes of economic benefit its production, sale, and long term airline use will bring to the United States.

The SST and the Upper Atmosphere

- There is no evidence that the SST will "pollute the upper atmosphere in such a way as may result in terrible alterations of global weather." There are theories to that effect, but they are theories only. The best scientific judgement available to the Government clearly indicates that there will be no significant adverse effect on weather.
- We have been advised by the Environmental Science Services Administration that "it is the view of the Office of Meteorological Research that although no unequivocal answer can be offered, the general opinion of a large group of scientists almost unanimously rejects any significant threat to modification of the weather" from SST operations.
- A later report by the ESSA Resources Laboratory concludes that "until calculations truly reflecting the total atmospheric response to increased water vapor and carbon dioxide suggest otherwise, there is no basis for believing that any significant weather changes will result from the release of these substances from projected operation of SST aircraft."

- The National Research Council of the National Academy of Sciences has reported as follows: "The aerospace age has added another dimension to the problem of inadvertent modification. The advent of supersonic transports, flying routinely in the stratosphere, has raised a question concerning possible consequences of the additional water vapor to be injected by these aircraft into the stratosphere. Our tentative conclusion, based on an assumed traffic volume of 1600 flights per day, is that neither additional cloudiness (contrails), nor water vapor absorption of a long-wave radiation will be sufficient to disturb appreciably either stratospheric properties or the large-scale circulations that are influenced by its thermodynamic state."
- Under standard atmospheric conditions, aircraft are unlikely to produce contrails below an altitude of about 25,000 feet or above 60,000 feet. Since virtually all SST cruise operations will be above 60,000 feet (the level above which contrails are unlikely to form), the theory that SST-induced contrails may "freeze" in the stratosphere and thereby affect the weather is not substantiated.

The SST and Flight Safety

- The Friends of the Earth state flatly that the SST "will be far more dangerous than present aircraft because of severe problems of metal fatigue, landing speed, visibility and maneuverability." There are absolutely no justifications for such sweeping statements.
- The SST will be built of titanium, stronger than steel. Its landing speed will be similar to many of the present commercial air carrier jets. The approach speed for the U.S. SST, for example, will be 153 knots, compared to 148 knots for the DC-8-61F. The SST will fly high above the airplanes used by today's jets, and will be instrument controlled all the way. It will also be the beneficiary of a greatly improved air traffic control system, now being automated and expanded to meet the continuing growth in air traffic.

SST Range

- The range of the U.S. SST, approximately 4,000 miles, is more than ample for trans-Atlantic operations and, with one refueling stop, for trans-Pacific flights.
- Range will undoubtedly increase as performance efficiencies are improved. When first designed, the 707 did not have a Paris to New York capability non-stop.

The SST and the "Jet Set" Syndrome

- The SST enables us to calculate distances in time, not miles. Because of the SST's great speed (1800 miles per hour at cruise compared, for example, to 625 mph for the 747) one airplane can carry more passengers on more trips in a given period of time. The SST, therefore, is more "productive" and potentially more profitable to the airlines, which means that fares will probably be about the same as on subsonic aircraft. (The 2707, for example, has 30 per cent fewer seats than the 747 but will be 75 per cent more productive.)
- Personnel costs traditionally go up much faster than fuel costs. In fact, in recent years jet fuel costs have declined. Because of the reduced elapsed flight times, crew costs per SST flight will be lower than for slower aircraft, and should more than offset the greater fuel consumption.
- By 1980, when the U.S. SST will be in commercial service, some 50 million Americans (and many more millions of people worldwide) will be traveling internationally. This is three times today's international traffic levels, and equal to the number of Americans who travel by air carrier each year within the United States.

Why the SST Is Being Built

- The President has indicated he favors continuing the SST development program because of its importance to the U.S. position of aviation leadership. Aircraft represent one of our major exports, and in 1968 accounted for \$2.5 billion in foreign sales.
- Every advance in transportation, throughout history, has served to reduce the time spent in transit. People have responded to these opportunities to save time, and there is no reason to assume that, given the option, people traveling internationally in the future will not prefer to cut today's flight times in half.

The SST and the Environment

- The SST is the only aircraft development program ever undertaken with noise limitations written into the contract.
- The SST engines will be smoke-free, and powerful enough to take the airplane to altitude quickly, to reduce the sound over the community.

- The U.S. SST will be compatible with airports used for intercontinental-range jets, and with boarding facilities used by the 747 and other large-capacity sub-sonic jets.

- Overall, the airplane is one of the most land-conservative forms of transportation. Airports consume far less real estate than are required for highways or railways. New airports (and the United States is estimated to need some 800 new airports in the next ten years, regardless of whether the SST flies or not) will undoubtedly be designed so as to "contain" most of the objectionable noise of aircraft operations within their boundaries, and the airport property will be developed to exploit aviation-related activities.

In summary, the Office of Supersonic Transport Development is not in conflict with the Environmental Quality Control Act. The SST program does, in fact, comply with the provisions of that act. The Secretary of Transportation has directed that concern for the preservation and improvement of the environment must be accorded the same top-level priority as is given to safety. Transportation programs obviously cannot be halted in a society as dependent on mobility as our own. Our responsibility is to apply America's resourcefulness to the attainment of transportation progress that will not unduly disrupt the environment or distress the quality of life. The SST program is structured accordingly.

The full story of the Supersonic Transport Development Program has been provided to the Congress. The issues have been explored and debated many times. One of the purposes of the prototype program is to "fly before we buy." The two prototype aircraft to be built under the present contract must demonstrate, among other things, that the airplane will meet the stringent environmental standards prescribed for it. It is not the purpose or intent of the Government to permit commercial operation of any airplane that would be an affront to the well-being of the public, or risk the safety of its passengers. The very fact that the Government is involved in the prototype development program provides strong assurances that the Supersonic Transport will in no way violate the public trust or conflict with the public interest.

Office of SST Development
Department of Transportation
800 Independence Ave., S.W.
Washington, D. C. 20590

SST ENVIRONMENTAL ISSUES

Water Vapor

Recent speculation about supersonic transports creating contrails at high altitude has led some persons to believe that a permanent cloud cover will be formed with possible adverse effects on global temperatures.

Actually, at the cruise altitude of the U. S. SST--60,000 to 70,000 feet--contrails are seldom if ever formed. Contrails are formed by a combination of the right temperature and relative humidity, but usually at lower altitudes. During the past decade, military pilots have flown supersonic airplanes hundreds of thousands of hours at high altitude. Contrails above 60,000 feet are rare. Most contrails occur at the 30,000- to 40,000-foot altitudes where the subsonic jet transports operate today.

All indications are that the SST's effects on the upper atmosphere will be negligible. Two scientific groups -- the National Research Council of the National Academy of Sciences, and the Office of Meteorological Research -- have studied the situation and reported there will be no appreciable disturbance of the Earth's normal atmospheric balance by a fleet of SSTs making 1,600 flights each day (NAS Report 1350, dated 1966).

The study of the National Academy of Sciences showed that 400 SSTs, each making four flights a day, would produce about 150,000 tons of water. Although this sounds impressive, it is about the same amount of water injected into the stratosphere by a single large cumulonimbus cloud in the tropics.

Carbon Emissions

Turbojet engines produce carbon monoxide -- about half as much as an automobile engine, per pound of fuel burned. Hydrocarbon emissions, seen as black smoke, indicate inefficient burning of fuel; the latest jet engines do not smoke. No visible carbon emissions are expected from the SST's engines when the airliner enters commercial service in the late 1970s.

The SST engine with its high-temperature combustors will be one of the most efficient gas turbine engines ever built. The smoke-free exhaust is estimated to contain some particles of solid material and some oxides; however, the quantity of toxic gases such as carbon monoxide (CO) is estimated to be smaller than those generated by internal combustion engines on buses and automobiles. Measurements of the exhaust gas composition of the SST engine are currently being made, and the results will be compared with the theoretical calculations for subsonic jet engines and automobiles.

The SST will have far less detrimental effect on the quality of the environment than any means of transportation developed to date. A study by Professor R. F. Sawyer of the University of California at Berkeley shows that carbon monoxide and hydrocarbon emissions for today's jet engines during cruise conditions are under one per cent of average automobile emissions.

Noise and Sonic Boom

The SST has powerful engines. They will make more noise on the airports than present jet engines but their tremendous power will permit them to raise quickly over the community on takeoff and the engine sound will be less than today's jets at the standard measuring point from the end of the runways -- usually 3-1/2 miles after the takeoff runs begins. Using today's yardsticks for measuring sound, the U.S. SST will be quieter than today's jets on both climb-out and approach.

On climb-out the U.S. SST will be twice as high as today's subsonics at the same place under the flight path. On landing, the plane's design (wide span with separate tail and high-lift devices) will provide excellent low-speed handling characteristics, allowing the pilot to cut power for landing. In addition, he can choke off the engine inlet by creating a sonic wave which blocks turbine whine from coming out the front end of the engine.

Sonic booms created by the SST will not be heard because supersonic flights will not be made over populated areas. At the SST's cruise altitude of about 65,000 feet, the amount of over-pressure produced is about two pounds per square foot. This is comparable to the overpressure experienced by a man rising 50 feet in an elevator. But the pressure change is sudden and probably would be annoying to people under the flight path. It would not damage structures or break windows. Actually, porthole windows on ships are designed to withstand forces 100 times stronger than the overpressure created by the SST at cruise altitude.

Radiation Exposure

Everyone is exposed to radiation. The radiation unit commonly used to measure how much radiation a person receives is expressed in millirems (mrem). The average person receives 125 mrems each year from natural sources (cosmic rays, the ground he walks on, the food he eats). People living in Denver receive nearly three times as much radiation as people do in New York. A three-fold increase sounds big but three times practically nothing still doesn't amount to much. Actually, in some areas of the world natural radiation is as high as 12,000 mrems per year. People live there about as well as anywhere else.

In other words, it's relative. Basic radiation standards established by the National Committee on Radiation Protection recommend that the general public not be exposed to more than 500 mrems per year. Atomic workers are limited to 5,000 mrems yearly.

Radiation exposure increases with altitude but a person would have to make more than 250 trips from Seattle to New York in a jetliner flying at altitudes between 30,000 to 40,000 feet to receive an additional 500 mrems of exposure. Supersonic flights at 65,000 feet would increase the radiation dose by a factor of three because the thinner atmosphere won't soak up as much of the radiation. This means it is a stand-off. An average passenger on an SST would be exposed to three times the radiation but only one-third as long.

During the periods of solar flare activity (usually on 11-year cycles) the additional radiation dose from a major solar flare could increase the exposure about 1,000 mremes. However, U.S. satellite systems regularly monitor solar flare activity and if a significant event occurred, there is plenty of time to divert to a lower altitude.

In Conclusion

The protection of our environment has become a highly vocal issue in recent months -- and rightly so. Past management of our air, water and soil resources has not been adequate.

However, environmental protection is an emotional issue and such issues often defy logical analysis.

The SST will have no appreciable effect on the atmosphere. Its sonic boom will not be heard by those living in populated areas. It will present no radiation hazard to the average traveler.

What the SST will do is provide a new, high-speed transportation system around the world. Any place on Earth can be reached in 12 hours or less.

HOW TO KEEP TRACK OF LOCAL ACTIONS

Contact your local state air pollution control authorities to find out where and when hearings will be held to set standards based on criteria published by HEW. You may find these authorities within the State Public Health Department or in a separate commission.

The attached list shows those states in which air quality control regions have been established, or are planned to be established within the next few months.

Criteria which have been issued for about a year, such as particulates and oxides of sulfur, have probably already been covered by standards in those states where air quality control regions were established in 1968. The same is likely to be true for those states where air quality control regions were set up in 1969. In both cases, these states are probably now in the process of having public hearings to develop standards on the most recent criteria covering carbon monoxide.

In states where the first air quality control region will be established by June of 1970, you can expect hearings soon thereafter on the development of standards for all criteria published to date.

5/22/70

STATES IN WHICH AIR QUALITY CONTROL REGIONS
HAVE BEEN ESTABLISHED

STATE	DATE AQCR ESTABLISHED & NUMBER OF CITIES INVOLVED			
	June 1968	March 1969	Planned June 1970	End of Summer 1970
Alabama	1		4	
Alaska		1		1
Arizona	1			
Arkansas			1	1
California	2			
Colorado	1			
Connecticut	1			
Delaware				
Dist. of Col.	1			
Florida		1	1	
Georgia		1	1	2
Hawaii		1		
Idaho		1		2
Illinois	1		2	3
Indiana	1		2	
Iowa				4
Kansas				
Kentucky	1		3	
Louisiana		1		2
Maine		1		1
Maryland	1		1	
Massachusetts	1	2		
Michigan	1		2	
Minnesota	2		2	
Mississippi			1	1
Missouri	2		1	1
Montana		1		
Nebraska		1		1
Nevada		1		
New Hampshire		1		1
New Jersey	1		1	
New Mexico		1		1

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STATE	DATE AQCR ESTABLISHED & NUMBER OF CITIES INVOLVE			
	June 1968	March 1969	Planned June 1970	End of Summer 1970
New York	2		1	
North Carolina		1		1
North Dakota		2		
Ohio	5		4	
Oklahoma		1	2	
Oregon		1		
Pennsylvania	2	1	4	
Puerto Rico		1		
Rhode Island	1			
South Carolina				2
South Dakota		1		
Tennessee	1	1	3	
Texas	4	3		1
Utah		1		
Vermont		1		
Virgin Islands		1		
Virginia			1	1
Washington	2			2
West Virginia			3	
Wisconsin		1	4	1
Wyoming		1		

May 20, 1970

NOISE ABATEMENT SEMINAR

HISTORICAL SUMMARY

Chronology

- 1952 . Air Force concern with air base noise.
 - . Airline concern with airport noise.
 - . ATA and ALPA develop noise abatement takeoff and landing procedures for piston aircraft.
- 1952-54 . Initial preferential runways assigned for noise abatement
- 1956 . Airlines order noise suppressors for turbojet aircraft for delivery 1958 and beyond.
- 1957 . Perceived Noise Level (PNL) developed.
- 1958 . Entry of turbojet aircraft into U. S. commercial service. (discounting earlier limited Comet operations).
 - . Port of New York Authority set 112 PNdB limit for take-off.
- 1960 . Entry of turbofan aircraft into airline service.
 - . London Airport sets 110 PNdB for day & 102 for night for take-off.
- 1962 . Griggs case-landmark decision: airport operator liable.
 - . Congressional Hearings on Noise.
- 1963 . U. K. Parliamentary Investigation (Wilson Report)
 - . U. S. SST design goals.
- 1964 . Enforcement Hempstead Ordinance at JFK rejected by lower court.
 - . Park Ridge Ordinance near O'Hare enacted but not enforced.

- . Martin vs. Port of Seattle: aircraft noise compensable.
- 1964-65 . Entry of quieter 2 and 3 engine aircraft - 727, BAC-111, DC-9.
- 1965 . Office of Science and Technology (OST) Aircraft Noise Panel.
- 1966 . Program Evaluation Development Committee - OST.
 - . FAA Noise certification proposal (Blatt letter).
 - . U. K. International Conference on Aircraft Noise.
- 1967 . DOT Interagency Aircraft Noise Abatement Program.
 - . Tripartite Meetings initiated (France, U. K., and U. S.)
- 1968 . Public Law 90-411.
 - . Supreme Court - American Airlines vs. City of Hempstead - certiorari denied.
 - . FAA/Industry Task Force on Aircraft Noise Certification.
 - . Introduction of B-737.
- 1969 . FAA Aircraft Noise Certification NPRM and Rule (FAR Part 36).
 - . B-747 introduced. Employs quieter high by-pass ratio engines, the forerunner of quieter engines for future aircraft.
 - . ICAO Special Meeting (29 Nations) recommends ICAO annex on Aircraft Noise (Certification).

INFORMATION RELATIVE TO REDUCING NOISE BY
RETROFITTING EXISTING JET TRANSPORT AIRPLANES

Airport Community Noise

During the past decade, as air transportation operations have expanded, Government and industry have been steadily increasing the tempo of their cooperative efforts to reduce the adverse impact of aircraft noise on the airport communities. Attention has been directed toward engine design and installation as well as toward aircraft operating procedures. Major efforts have been, and are being, exerted toward development first, of an understanding of the complex technology of acoustics, then of practical applications of that technology. Public and Congressional concern have provided added impetus. Legislation has followed technical progress and imposed stringent mandatory standards on newly designed aircraft. The promise of preferential procurement by the airlines provides additional stimulus to the manufacturers to develop quieter engines and airplanes. Obviously, a manufacturer who can first offer a safe, reliable, economical and "quiet" airplane will realize a great commercial advantage.

Historically, the original commercial turbojet transport was equipped with costly sound suppressors to achieve initial acceptability by airport neighbors. Later, the turbofan, which offered a significant reduction in noise levels over the suppressed turbojet, was introduced. The turbofan rapidly became the standard type powerplant in the U. S. Continued expansion of operations to meet the public demand for transportation caused even those airplanes to become objectionable at many major airports. When specifications for the 747 superjet were established in 1966, noise reduction was a major design objective for the first time in a new airplane. Experience with the 747 during the past year

-2-

has demonstrated the effectiveness of the manufacturers' efforts to produce a larger, more efficient airplane with substantially lower noise radiation characteristics than the 707/DC-8 aircraft which it both complements and displaces. Furthermore, these same techniques are being utilized in the design of the DC-10 and L-1011.

Airbus Implications

One of the basic reasons behind the new, high capacity transport aircraft is the need to accommodate the growing number of air passengers with fewer flight operations and thus to alleviate the airport/airways congestion. Obviously, at any particular time, the introduction of the larger aircraft will also permit reduction in the number of 707/DC-8 flights and the noise associated therewith. As an example, when Pan American recently inaugurated New York to London service with the 747, it substituted one 747 flight for two 707 flights.

Retrofit Activity

There are approximately 2200 airplanes equipped with turbojet engines in air carrier service and on order. These include the scheduled and supplemental U. S. airlines plus Air Canada and Canadian Pacific Airlines. Of the above total of 2200, approximately 1950 are fan jets and the remainder are "straight" jets (no fan).

Studies and tests have been underway for a long time to evaluate the technical and economic feasibility of retrofitting existing jet transport airplanes to reduce noise. These studies have investigated reduction of landing approach noise (the high-pitched whine of the fan) and take-off noise (the roar produced by the thrust of air coming out of the rear of the engine).

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Among the "noisiest" of the four-engined fan jets on landing approach are the Boeing 707-320 B's and C's and the DC-8-50's and -61's. There are approximately 275 of the former and 165 of the latter in service. This total of 440 airplanes represents about one-fifth of the turbojet airplanes in U. S. and Canadian service. Because these models were "noisier," because a considerable number were operational, and because their designs promised the most potential gain in noise reduction the FAA and NASA, in cooperation with the manufacturers, selected them for investigation back in 1966. In May 1967 NASA awarded contracts to Boeing and Douglas to investigate reduction of fan noise by redesign and by incorporating sound-proofing material in the fan inlets and exhaust ducts. Each contractor modified one airplane which was test flown for in-flight noise measurement. These contracts were essentially completed last fall at a cost of approximately \$16,000,000 which was paid for by the NASA.

Results

The flight tests showed that the maximum approach noise reduction (landing configuration) was 12.0 EPNdB for the DC-8 and 15.5 EPNdB for the 707. This is equivalent to cutting the "approach to land" noise in half.

On take-off, when most of the noise is caused by the turbulent exhaust gases, noise reduction on each aircraft was on the order of 3 EPNdB. This reduction would not be noticeable to the average observer.

Suitability

No tests to determine the durability of these treated engine nacelles have been accomplished. Each company flew the aircraft with the modified nacelles

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for less than 30 hours each; just long enough to make comparative noise measurements.

What lies ahead is the need to flight test and ground test this hardware to insure its acceptability for every day use on commercial transports. This may take the manufacturers as long as two years, culminating in FAA certification.

When Available?

Both Boeing and Douglas have estimated that beyond the two years that will be required to produce a FAA "certificated" nacelle, it will take another three years to manufacture the retrofit nacelles and deliver them to the airlines once a "go-ahead" decision is made.

What is Involved

Retrofit costs per airline for the DC-8 were estimated by the manufacturer at \$665,000 based on a production run of 250 airplanes. For the 707 the estimated retrofit costs were \$1,000,000 per airplane based on a production run of 400 airplanes. The total cost for the 440 airplanes would approach \$400,000,000. These costs were not checked in detail by the airlines and appear on the low side.

A number of questions are raised when costs are balanced against the tangible benefits to be derived. First, only 20% of the airline fleet would be modified - the remaining 80% would be producing the same noise as now. Also more than one quarter of the 20% (over 100 airplanes) are in international operations and their modification would therefore have minimal effect at U. S. airports generally. Second, there would be no benefit to people

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living in communities near airports not served by four-engined equipment; many airports have very little four-engine traffic. Third, since take-off noise is relatively unaffected there would be no significant benefit to people who are bothered by noise from planes taking off and climbing.

In short, only those people living close to the approach paths at airports where the 440 Boeing 320 B's and C's and the Douglas DC-8-50's and -61's are operated would be benefited. Such airports would be the large and medium hubs which number approximately 60 out of a total of approximately 150 of such U. S. airports. People living close to the approach paths at such airports would have some relief from fan whine noise from about one-fifth of the airplanes passing overhead (assuming same ratio of modified-to-unmodified planes*). It is doubtful that the majority of these people would notice much difference, but in any case it is probable that any initial relief would soon be forgotten amid the total traffic, more than 80% of which would still be making the same noise as before at U. S. airports. In many cases the use of preferential runways for four-engined equipment would further reduce the locations where lower approach noise would be helpful to people on the ground.

There would be no relief at all for about two and a half years (i.e., until the modification could be started); and by the time all of the 440 airplanes could be modified (about five years from start of a decision to retrofit) many of the present four-engine jets would be retired or slated for retirement to make way for the wide-bodied jets which will be quieter overall.

*Probably a conservative assumption since the more numerous smaller two- and three-engine airplanes make many more landings and take-offs than the larger four-engine equipment.

Perspective

The reduction in approach noise on the airplanes in question would put them at roughly the same levels as the approach noise on the B-727s, DC-9s and B-737s, which comprise more than one-half of the airline fleets. This lower level is still too high for most communities. For example, the noise problems at places such as LaGuardia and Washington National are caused by this category of airplanes. No four-engine jet equipment is involved. For this reason it is doubtful that the modifications in question would significantly affect the noise problem in the United States as a whole.

As far as modifying airplanes other than those discussed herein (e.g., the B-727s), any gains that could be achieved on these relatively quieter airplanes would seem to be even more questionable from a cost benefit viewpoint. Further on this subject, the FAA has contracted with the Rohr Corporation to conduct an economic feasibility study of retrofitting commercial jet transports with acoustically treated engine nacelles to reduce jet airplane noise. This study will cover not only the 707s and DC-8s but also 720s, 727s, and DC-9s. Rohr is required to submit a report to FAA by May 12, 1970.

Summary

It appears from the work described above that very little progress in true noise abatement can be made by modifying equipment in service. The small net benefits seem negligible against the costs involved - to say nothing of the time lag required for modification.

Tangible benefits will also come from new designs such as in the quieter wide-bodied jets because of higher bypass ratio, advanced basic engine

-7-

design and the use of more sound absorbing materials. Each new powerplant design improves the situation, and gradually airplane noise should become tolerable to the great majority of people.

FOR IMMEDIATE RELEASE

A FACT SHEET ON AIRCRAFT NOISE ABATEMENT

The five billion dollars the airlines will invest in the first half of the 1970's in 205 wide-body, advanced-technology jet aircraft-- the 747, the L-1011 and the DC-10 -- will buy many things, from more productive aircraft to aircraft that are virtually smoke-free. And since these aircraft will be quieter than present planes, the five-billion-dollar investment is, in a very real sense, an investment in noise abatement as well. Engine design work, along with other avenues to more effective noise abatement, are covered in the following fact sheet.

Our way of life depends upon the conversion of energy to power and power makes noise. This growing volume of noise, whether from power mowers or jet planes, has rightly been recognized as eroding the quality of man's environment.

A reaction occurs when the high velocity gases from a jet engine are thrust into the normal atmosphere. This reaction is called the shear. It causes most of the noise associated with jet engines

Total elimination of shear would mean the abandonment of modern air travel. Shear can be reduced by reducing the thrust. But reducing the thrust reduces the power and power cannot be reduced completely.

Basically, there are two approaches to reducing the objectionable characteristics of aircraft noise. The first is reducing noise at its source. The second is reducing people's exposure to noise.

Reducing Noise At Its Source

The airlines spent \$200 million for development and installation of noise suppressors for the first commercial jets.

Earlier turbojet engines were replaced by the quieter turbofan engines. Turbofan engines enable some of the air to bypass the turbine. The bypass air travels at lower velocity. It produces less shear and this means less noise. Increasing the ratio of bypass air to jet exhaust (referred to by engineers as the bypass ratio) is one of the most significant techniques in reducing noise at its source.

Bypass ratios have been greatly increased in the design of engines for the wide-body jets. Here is an example of what this means. The first of the superjets, the 747, is a 700,000-pound jet transport, much larger than any commercial jet before. It will fly at 625 miles-per-hour, somewhat faster than any jet before. Yet it is substantially quieter than any jet before.

Much has been learned about reducing noise from the front end of jet engines. This is the high-pitched, siren-like whine heard on approach. New design features for the nacelle (this is the compartment enclosing the engine) and other design developments have been incorporated into the engines being produced for the wide-body jets. These developments will virtually eliminate the siren-like whine.

REDUCING EXPOSURE TO NOISE

There are four basic ways of reducing people's exposure to noise: curtailment of flight operations, noise abatement procedures by aircraft on landing and takeoff, better insulation for homes and buildings near aircraft arrival and departure routes and compatible land use.

Curtailment of flight erodes the nation's transportation system. The airlines believe this approach should be discarded.

Airlines and their pilots have been following noise abatement procedures for more than ten years. This is one of the oldest noise-reduction techniques. It is designed to maximize the distance and altitude between the aircraft and people on the ground. Noise abatement procedures may already have been used to their fullest extent. They are a mixed blessing. They sometimes relieve one community of noise at the expense of another. Noise abatement procedures are expensive in that they prevent an airport from accommodating the traffic it could otherwise handle safely and efficiently. Usually these procedures require an aircraft to be flown in a manner that degrades the performance expected from the aircraft's flight tests and certification. If carried too far, such procedures could endanger safety.

Better soundproofing of homes and buildings is an under-used approach to reducing people's exposure to noise. The construction techniques are known and available.

Compatible land use is the most promising means of reducing people's exposure to noise. Airports are places of work. Land values adjacent to airports have been rising tremendously. Both of these factors, plus the growing number of industries making greater use of air freight and air passenger transportation, suggest that industrial and commercial buildings would represent a more productive use of land near airports than would housing developments. This approach would also reduce the noise problem materially.

There is no single solution to noise abatement. Engine manufacturers, the airlines, local authorities and the Federal Government all must play a part in reducing people's exposure to noise.

FACT SHEET

REDUCING POLLUTION FROM JET AIRCRAFT

JET EXHAUST EMISSIONS

Numerous studies have been made by air pollution control authorities, in cooperation with the airlines and engine manufacturers. These studies reveal that the principal emissions from jet exhaust are carbon monoxide, hydrocarbons, nitrogen oxides and particulates - mostly visible particles of unburned carbon that make up the smoke plume seen trailing jet engines. In every case, the amount contributed by aircraft is very small by comparison with all other sources of the same emission. In a December, 1968 report to the Congress, the Secretary of Health, Education and Welfare said aircraft emissions, as a percentage of total emissions from other sources, were: carbon monoxide - 1.2%; hydrocarbon - 0.7%; nitrogen oxide - 0.1%; particulate - 0.1%.

INDUSTRY PROGRAM

The relatively small proportion of total pollutants contributed by aircraft has not deterred the airlines and engine manufacturers from seeking ways to reduce objectionable jet aircraft exhaust emissions even further. The most objectionable of jet aircraft emissions - the smoke plume - has been the object of industry efforts for over ten years. Early progress was made as a by-product of the technological change from the first turbojet engines which used water injection on takeoff to the turbofan engine. More recent technological improvements have now brought significant progress, with the introduction of new almost smoke-free engines on new aircraft and the announcement of plans to begin retrofitting existing engines with smoke-reducing modifications.

SMOKE INCREASE HALTED

The new, wide-bodied jets (747, DC-10 and L-1011) are virtually smoke free. That is, their emissions are barely visible. (Anyone who has seen a 747 takeoff knows what this means). These aircraft make up

85 per cent of all new aircraft slated to be delivered to the airlines over the next four years. Thus, the increase of smoke from new aircraft entering the fleet has been stopped.

RETROFIT PROGRAM COMPLETE BY LATE 1972

A five-year old program to reduce the smoke from engines already in service has progressed to the point where the airlines on January 20 announced they would begin installing smoke reduction devices on JT8-D engines, and that the retrofit program would be substantially completed by 1972.

RETROFIT OF JT8-D WILL SOLVE MOST OF PROBLEM

The wisdom of the five-year old decision to start with the JT8-D is underscored by a study prepared last year for the National Air Pollution Control Administration by the Northern Research and Engineering Corporation. This study showed that the small jets powered by the JT8-D (Boeing 727, 737 and McDonnell-Douglas DC-9) contribute 55 per cent of the smoke plumes, based on daily landings and takeoffs. But when this figure is weighted by a factor to account for observed plume density, the JT8-D engine was found to contribute 70 per cent of the jet aircraft smoke plume problem.

Some of the engines powering the long-range, four-engine jets also produce plumes as dense as the JT8-D, but their contribution to the total jet aircraft pollution problem is not so great because there are fewer of them and on the long-haul trips they make fewer landings and takeoffs per day.

WHAT DOES RETROFIT INVOLVE?

Reduced smoke combustors cannot be installed in an engine while it is still on the airplane. The engine must be taken off, moved into the engine overhaul shop and taken apart. The combustors and their associated components form part of what is called the "hot section" of the engine. Each JT8-D has nine combustors and associated components, such as fuel nozzles.

When all of the other parts of the hot section have been inspected and, where necessary, replaced or repaired, the engine must be re-assembled. It is then run in a test cell to measure its performance at various power settings and insure that it is fit to be put on another airplane and go back into service

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FEDERAL, STATE AND LOCAL REGULATIONS OF AIRCRAFT ENGINE EMISSIONS

FEDERAL REGULATION

Clean Air Act of 1963, as amended by the Air Quality Act of 1967 (42 U.S.C. 1857)

Under this Act, the National Air Pollution Control Administration (NAPCA) of HEW is to designate interstate air quality control regions (AQCRs). Over 30 AQCRs have already been designated and a total of 91 are scheduled by the end of the summer of 1970.

HEW is also required to publish air quality criteria for those pollutants harmful to health or welfare, and to publish reports on the technology which can be employed to control the sources of those pollutants. Criteria have been published for particulates, sulfur oxides and carbon monoxide. The criteria for oxides of nitrogen are expected in the spring of 1971.

As soon as HEW has designated a region, has published criteria on a pollutant or a combination of pollutants, and has published the related control technology information, the State or States responsible for the designated region are on notice to develop standards for the region for those pollutants and to develop plans for implementing the standards. The Governor or Governors of the affected States have 90 days to signify their intent to set air quality standards, 180 additional days to hold public hearings and adopt standards, and a further 180 days to adopt plans for implementation and enforcement of the standards. The standards and plans for implementation are then submitted to HEW for review and approval.

Therefore, under presently effective legislation, control of aircraft emissions for the most part is in the regional AQCRs. ATA is supporting efforts to amend the Clean Air Act so that control of all aircraft emissions comes under the exclusive control of the Federal government. The six principles to be embraced in this legislation are:

- 1. Federal preemption of regulation of airplane engine emissions;
2. HEW should have the authority to promulgate regulations establishing emissions standards applicable to aircraft engines;

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3. These regulations should be prescribed by HEW only after consultation with FAA in order to assure consideration of aircraft safety;
4. These regulations should exclude any standards for aviation fuel or additives, since FAA already has complete jurisdiction over such standards;
5. Only FAA should be assigned the task of applying the HEW standards and regulations, in view of FAA's complete jurisdiction over airplane engine design, construction, operation, and maintenance; and
6. The legislation giving HEW and FAA jurisdiction should recognize, as does the noise legislation, that technical and economic feasibility must be taken into account in prescribing regulations.

ATA believes that either the Muskie Bill, (Air Quality Improvement Act of 1970, S. 3229), with our proposed amendments, or the Rogers Bill, (Clean Air Act Amendments of 1970, H. R. 17235), with one minor amendment, is the vehicle to accomplish these six objectives.

Federal Aviation Act of 1958 (49 U.S.C. 1301 et seq.)

In March, 1970 the FAA issued an Advance Notice of Proposed Rule Making (ANPRM) on "Aircraft Engine Emissions" (35 FR 5264, March 28, 1970). The ANPRM seeks answers to a series of technical questions with a view to proposing the establishment of technical and economically feasible aircraft engine emission standards for all types of aircraft. Industry comments, to be prepared by ATA, are to be filed by July 1, 1970.

Government Watch Dog Councils and Commissions

Six cabinet departments (HEW, Interior, HUD, Transportation, Agriculture, and Commerce) plus a host of other federal agencies currently preside over about 90 environmental protection programs. Last year, Congress recognized the need for coordination, and created a three-member Council on Environmental Quality to advise the President similar to the way the Council of Economic Advisers does on economic affairs. This body may be the most important of the watchdog groups. On April 9, 1970, the President established a National Industrial Pollution Control Council composed of industrial leaders who will serve in an advisory capacity to the President, the Council on Environmental Quality and other groups on environmental improvement. Two airline presidents, George E. Keck, United Air Lines and Charles C. Tillinghast, Jr., Trans World Airlines, are members of this Council.

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President Nixon had previously established a cabinet-level Environmental Quality Council, a Task Force on Air Pollution and a Citizens' Advisory Committee on Environmental Quality. The President has also stated that there will be a major reshuffling of federal agencies dealing with the environment. Senator Muskie has sponsored a bill which would create an Environmental Control Agency, separate from cabinet departments, to administer and watch over government environmental control programs.

Airline/Government Cooperation Programs

Last January, in a meeting with the Secretary of HEW and the Secretary of Transportation, the representatives of 31 airlines voluntarily agreed virtually to eliminate smoke pollution from aircraft using the JT8-D engine by installing new smoke reduction burner cans. This conversion will be substantially completed by the end of 1972 and completed in 1973.

Several years ago the airline industry joined with the engine manufacturers in a program to produce an experimental combustor for the JT8-D engine. The JT8-D engine, which powers the Boeing 727 and 737, and the McDonnell Douglas DC-9, was selected because it emits a plume of smoke which appears denser than that of other jet engines, and because the three aircraft types using the engine make up half the current airline fleet. It is estimated that this program will result in the elimination of about 70 per cent of the total smoke emissions by airlines.

STATE REGULATION

All 50 States, the District of Columbia, Guam, Puerto Rico, and the Virgin Islands have air pollution laws. HEW has compiled these laws in a book entitled, A Digest of State Air Pollution Laws, for sale by the U.S. Government Printing Office for \$1.50.

Some of these states have attempted to enforce their air pollution laws against the airline industry, either by law suits or other means of compliance. A brief discussion of these efforts follows:

New Jersey:

In August, 1969 New Jersey filed actions in State Court against scheduled airlines serving Newark using JT8-D engines, alleging violation of the New Jersey Air Pollution Control Code. The suit sought a court order

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imposing a \$2,500 fine for each violation, and ordering each carrier: (a) to cease and desist from emitting smoke in violation of the Code; (b) to install such devices or modifications as to bring emissions within the permitted opacity of the Code (based on the Ringelmann Smoke Chart) and (c) to submit a detailed timetable for abating engine smoke.

In their answers the defendant carriers recited their substantial investment in operations at Newark; the public service character of their operation in New Jersey; constitutional limitations on state burdening of interstate commerce and interference with freedom of air transit and right to travel; and the paramount Federal interest in air traffic and development of civil aeronautics.

The case never went to trial, but instead was settled in February, 1970 on the basis of the carriers' voluntary agreement with HEW and DOT in January, 1970 to retrofit all JT8-D engines with new combustors, and that this program would be substantially completed by December 31, 1972. The stipulation preserved the airlines' position that the New Jersey pollution law, as applied to them was unconstitutional, and denied the jurisdiction of the Court and of the State of New Jersey to regulate emissions from their jet aircraft operating in interstate commerce.

Illinois:

In November, 1969 the State of Illinois filed suit in Cook County for an injunction against continued air pollution by 23 airlines using O'Hare and Midway Airports. The Illinois suit was broader than the New Jersey suit in two respects: 1) it was not confined to black smoke, but extended to noxious fumes, smoke and gases injurious to people's health and safety, and 2) it was not limited to the JT8-D engine, but included all aircraft. Foreign flag carriers as well as the U.S. airlines were named defendants. The action against the U.S. carrier defendants was dismissed in April, 1970, subject to the terms of a stipulation agreed upon by the parties. This stipulation is substantially the same as the one in the New Jersey case. The court concurrently dismissed with prejudice the action against the nine foreign flag defendants.

New York:

In January, 1970 New York filed an action against 19 ATA carrier members for contamination of the atmosphere by noxious jet emissions. The complaint seeks a court order enjoining further emission of fumes,

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gases, and smoke at all airports within the State of New York; ordering the airlines to install devices to modify their engines to preclude smoke darker than Ringelmann No. 2; requiring the submission of a timetable for such installation; and, in the event of failure or refusal, enjoining airlines' operations into New York airports.

Although negotiations have been held with New York to settle the case on the basis of a stipulation similar to that of the New Jersey and Illinois settlements, no settlement has yet been agreed upon.

Minnesota:

In February, 1970 the Minnesota Pollution Control Agency issued citations to airlines serving the Twin Cities alleging violation of the State's air pollution code. ATA made a joint response to the Minnesota authorities and attended administrative review meetings with them. The thrust of our presentation in this meeting, as well as in similar meetings with other state and local officials, was that the carriers are doing all that is technologically feasible as rapidly as possible to diminish airline air pollution, citing the Finch agreement as an example of our efforts.

Massachusetts:

In March, 1970 ATA represented the industry in a rulemaking proceeding before the Massachusetts Department of Health on proposed regulations for the control of air pollution in the Metropolitan Boston Air Pollution Control District. One proposed rule would prohibit aircraft smoke greater than Ringelmann No. 2 for more than 10 seconds during a landing or take-off. In a brief filed in April, the Massachusetts Port Authority took the position that the proposed regulation is an unconstitutional interference with interstate commerce.

Maryland and Missouri:

Preliminary inquiries have been directed to air carriers in Maryland and Missouri concerning aircraft engine emissions. Some carriers have responded individually to these preliminary inquiries. In addition, ATA represented the industry at a meeting with Maryland State officials in early May. Nine carriers operating in Maryland have been served with a voluntary compliance plan by the state.

LOCAL REGULATIONCalifornia-Los Angeles:

In January the airlines serving Los Angeles were advised by the Los Angeles Air Pollution Control District that, beginning January 1, 1971, it is their intention to enforce fully the provisions of their air pollution code.

Michigan-Detroit:

In November, 1969 the Wayne County Department of Health issued citations against six airlines serving Detroit requesting information on the action they are taking to abate aircraft smoke pollution. ATA staff met with the county authorities and have submitted answers to a series of technical questions asked by the county.

Pennsylvania-Pittsburgh:

In January, 1970 the airlines serving the Pittsburgh airport received questionnaires from the Allegheny County Health Department relating to air pollution control at the airport. The matter relates to pollution by carrier-owned airport facilities, rather than engine emissions.

PRIVATE ACTIONSGeisler v. Air West:

A suit was filed in Cook County, Illinois in November, 1969 against 18 airlines, including those serving the Chicago area, by two individuals as a class action to abate aircraft smoke pollution. The action was dismissed in April, 1970 because of plaintiffs' lack of standing to sue. Although plaintiffs purported to represent the general public in the Chicago area to abate an alleged "public nuisance", they failed to allege any special damages.

-ATA -

5/22/70

Remarks of Stuart G. Tipton
President, Air Transport Association of America
Before the Conference of National Organizations
Williamsburg, Virginia
May 6-8, 1970

AIR TRANSPORTATION - WITH ENVIRONMENTAL QUALITY

The airline industry exists for the purpose of providing safe, dependable, and fast transportation by air, to meet the public convenience and necessity. This is duty imposed on the airlines by Congress - and it is the yardstick by which we are regulated economically and technically.

We recognize that in the act of providing this needed public service, we also create public annoyance in the form of noise and air pollution. Our industry recognizes an obligation to make our contribution towards the reduction of both types of annoyance. For many years, we have devoted time, talent and money, to the reduction of both noise and air pollution. The results vary from impressive to spotty, and the reasons for this variation help to define the nature of the problem: first, we are dealing with a high degree of technological complexity; second, there is a division of responsibility that sometimes stalls meaningful solutions, and third, we are at times caught in the middle of a clash between opposing public needs (often the need for environmental quality is expressed in terms that would effectively preclude our meeting the other public need - for safe, dependable air transportation).

NOISE

A brief look at the problem of aircraft noise will illustrate these points. Let me say at the outset that this is not simply a matter of reducing

noise, but rather of reducing the annoyance created by aircraft noise. We are not dealing just with the amount of noise produced by jet engines, but rather with the effect produced by this noise on people living near airports and the flight paths that lead to and from airports. So we must work on changing the character of the noise as well as the quantity. Moreover, as studies funded by the National Aeronautics and Space Administration have shown, reaction to the same noise exposure varies with individuals. It is this subjective element that complicates efforts to determine whether a given noise reduction program will in fact have any measurable effect on reducing noise annoyance.

Another factor that inhibits our efforts to make better progress in noise abatement is the prevailing myth that the only way to reduce noise is to reduce it at the source. This is certainly one way - and the airlines have pursued it vigorously with the engine manufacturers ever since the start of the jet age over 12 years ago. The technology of higher bypass ratio fan engines has produced major increases in engine power without corresponding increases in engine noise. In combination with other technological improvements, the high bypass ratio fan engine holds out the prospect of actually reducing jet noise to a significant extent. But there is no technological basis that we know of for expecting a quiet jet engine. The reason is simply that thrust makes noise and thrust is the driving principle of jet transportation.

Improvements in new aircraft types do not change the noise produced by aircraft already in the fleet, and this is why some suggestions have been

made that the airlines should be required to retrofit existing aircraft with noise-reducing modifications developed by two aircraft manufacturers under a NASA contract. The airlines have grave reservations about the wisdom of such proposals. The cost is not inconsiderable: manufacturer's estimates, which the airlines find are usually too low, put the cost at half a million to a million dollars per airplane. The proposal is far from ready for adoption, even if cost were no object, because there has been no testing of the safety, reliability and overall performance of these quiet nacelles.

These objections might be capable of resolution, but the most important reason for questioning the wisdom of this particular retrofit proposal is that it does not really seem to offer any real reduction in noise annoyance. It only reduces approach noise - not takeoff noise - on some types of 707s and DC-8s, representing a total of 440 aircraft, or only 20 per cent of the airline fleet. Any noise reduction on this limited number of aircraft is bound to be lost in the overall noise of total aircraft movements at any airport where these particular aircraft would operate. Can you imagine the public reaction that could result, once this fact became obvious - especially if they have been led to expect some noticeable results from the retrofit?

It may well be that some form of retrofit program will be needed ultimately to contribute to the reduction of the noise annoyance. If so, it is essential that the program be one that will produce a significant enough reduction in noise annoyance to justify the cost of the program. To this end,

the airlines believe that a more thorough problem-solving analysis is a necessary first step. Among the questions this analysis should answer are: which aircraft/engine combinations need to be considered if we really want a noticeable reduction in noise annoyance? How should the amount of noise reduction per aircraft be divided between takeoff and approach noise?

The airline industry has invested substantial sums in noise reduction at the source. More than \$50 million was spent in developing noise suppressors for the early jets. By 1965, the airlines had invested \$150 million in putting these noise suppressors on their fleets. Also, because each new aircraft coming into the fleet is now required to meet Federal Aviation Administration noise criteria before certification for airline use, investment in future aircraft will also be an investment in noise abatement.

Besides reduction of noise at the source, two other avenues need to be followed: We must reduce the annoyance by altering the more objectionable characteristics of jet noise. This is being done with some success on the new technology engines in the wide body jets. The other avenue is a reduction in people's exposure to aircraft noise. This has been pursued by the airlines since before the jet age, by the use of approach and departure routes over least populated areas. However, the failure of local authorities, in nearly every case, to zone these areas of unused land has resulted in their being filled with housing developments - thus nullifying the noise abatement procedures adopted by airlines and local authorities. As the President's Commission on Noise spelled out in 1966, all three

efforts - reduction at source, use of noise abatement paths and flight procedures, and land use control - must be pushed with equal vigor if we really want to make significant inroads on the problem of community annoyance created by noise from jet aircraft.

AIR POLLUTION

When we look at airline industry progress in reducing our contribution to air pollution, the picture is much brighter. Perhaps the easiest way to show you what we mean is by a short six minute slide presentation.

The airlines recognize that contamination of the air through which they fly must be stopped. Working together, airlines and engine manufacturers long ago took the initiative to help reduce their contribution to air pollution. The results are shown by the progress we have made over the past ten years in reducing black smoke from jet engines.

If you have forgotten, this is how the first jets looked taking off, using water injection. Next came the turbofan engines, without water injection, greatly reducing takeoff smoke.

Our newest aircraft are the wide body jets - Boeing 747, McDonnell Douglas DC-10 and Lockheed L-1011. These aircraft use new technology engines two and a half times as powerful as those on earlier four-engine jets. As you can see from this 747 takeoff, its engines are virtually smoke-free. Over the next six years, 265 of these virtually smoke-free aircraft will enter the airline fleet. This represents an investment of \$5.5 billion, which is also an investment in smoke abatement.

We have passed an important milestone: the increase of smoke pollution from new aircraft has been halted. We are also engaged in an industry program to reduce the smoke from aircraft already in the fleet. This program is based on the industry's decision five years ago to concentrate first on reducing smoke emissions from the Pratt & Whitney JT8-D engine, which powers the three-engine Boeing 727, the twin-engine Boeing 737 and McDonnell Douglas DC-9. These three aircraft make up half of the airline fleet, but account for more than half the landings and takeoffs because they operate on short routes with frequent stops.

The smoke you have seen is unburned carbon which is produced by less than one per cent of the fuel burned by the jet engine. Reducing this smoke means improving the combustion process to the point where more of the fuel is burned - without at the same time making the mixture so lean that it is hard to re-light the engine after flame-out or shut down in flight.

Here you see the reduced smoke combustor design finally selected after three years of testing by Pratt & Whitney. Out of 500 designs tested on rigs, 200 were selected for further tests on full scale engines. The design finally chosen was then run for 200 hours to qualify for FAA certification and airline use. Then, in the summer of 1968, 37 engine sets of these combustors were delivered to four ATA member airlines for in-service operational evaluation, to find out what didn't work, what needed improving, and give this information to the manufacturer so that it could be fixed before widespread airline use. At the same time, the airlines announced their

intention of fitting all JT8-D engines with the new combustor, if the evaluation produced satisfactory results.

The amount of smoke reduction produced by this new combustor design is impressive. Here is a 737 with conventional smoky combustors. Next, look at the right engine of this 737 - one of the engines undergoing in-service evaluation. On January 20, 1970, 31 U. S. airlines announced they would soon begin installing the new combustors at regularly scheduled overhauls of the JT8-D engine and that this retrofit program would be substantially completed by the end of 1972. This program will take care of more than two-thirds of the exhaust smoke from jet engines now in service.

Reduced smoke combustors cannot be installed in an engine while it is still on the airplane. The engine must first be removed from the airplane, - here, the middle engine of a Boeing 727 - then it goes into the overhaul shop to be stripped down and taken apart. The fan ducts in the front part of the engine are removed and the front, or cold, section (top of picture) is separated from the rear, or hot section (bottom of picture). Here you see the hot section opened up, with three of the nine combustors already removed.

Airlines with adequate shop facilities can re-work the combustors, with kits supplied by the manufacturer. In that case, the combustor is cut open, modified, and then welded back together. Next the nozzles that spray fuel into the combustor are rebuilt and tested on a special test rig.

After this, the fuel control system is rebuilt and tested. Then the fuel system is put together and balanced. Finally, the engine is built up and moved to the test cell where during four to five hours, it is run at various power settings to verify that it is now ready for use in passenger service. When the test run is successfully completed the engine is finally ready for installation in a waiting airplane.

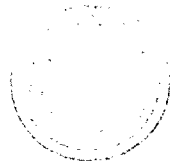
For the U. S. scheduled airlines the cost of the JT8-D engine retrofit program is on the order of \$30,000,000. The actual cost figures await the completion of the program in 1973.

In conclusion, the program to reduce smoke from jet engines was begun at industry initiative, and has already produced impressive results. The airlines and engine manufacturers will continue to contribute their experience and know-how to the overall goal of improving the quality of the air we breathe.

The effort to eliminate smoke from jet aircraft will be a success. Although we do not yet know how to control smoke from currently used engines other than the JT8-D, the airlines have addressed the engine manufacturers to develop a solution for the JT3, which powers the Boeing 707 and McDonnell Douglas DC-8. Work on that problem is in progress.

Aside from curing the smoke problem, what about the non-visible emissions? We know the amount is quite small. We also know that the new generation aircraft engines emit relatively fewer non-visible

pollutants than current ones. Quite frankly, however, no one has the answers to the myriad questions which could be raised about this subject. As of now the problem if there is one, has not yet been defined. To what extent, if any, do these non-visible emissions contribute to pollution of the air? No one -- neither government, science, nor ecology experts -- have been able to tell us.. As a result, the airlines are trying to find the answers on their own. We have created a top-level committee of airline officers whose sole function is to get those answers. Members of the committee include legal, medical, meteorological, and engine specialists -- all experts in their fields. If the answers are to be found, you can be sure we shall find them.



PUBLIC SERVICE COMMISSION
STATE OF NEVADA

February 10, 1971

215 SOUTH MAIN STREET
FLOOR FIFTH
CARSON CITY, NEVADA 89401

Address all communications to the Commission

The Honorable Thomas R. C. Wilson
Chairman, Committee on Ecology
Legislative Building
Carson City, Nevada 89701

Dear Senator Wilson:

We are enclosing eight (8) copies of our proposed "State Utility Environmental Protection Act" for the use of your Committee.

We are also attaching a list of those utilities to whom copies of this proposed Act have been mailed. As you will note from the transmittal letter, we have asked that their comments be referred to you.

If you have any questions, please don't hesitate to let us know.

Very truly yours,

PUBLIC SERVICE COMMISSION OF NEVADA

Noel A. Clark
NOEL A. CLARK
Chairman

NAC:NI
Enclosures
cc: Mr. Dave Mathews

Mr. Neil Plath
Sierra Pacific Power Company

Mr. Hank Greenspun
Community Cable TV

Mr. Paul S. Garwood
Nevada Bell

Mr. Harry Allen
Nevada Power Company

Lawrence V. Robertson, Jr., Esq.
Southwest Gas Corporation

Mr. Donald J. Carman
California-Pacific Utilities Co.

Mr. John P. Maguire
Continental Telephone Company

Mr. Walter T. Geary
Central Telephone Company

Mr. Donald T. Hall
Kingsbury Water Corp.

Mr. James Gordon
Sun Valley Water & Sanitation District

Mr. W. W. White
Incline Village Genl. Imp. Dist.

Mr. James H. Parrott
Clark County Sanitation District #1

Mr. George Plunkett
TV Pix, Inc.

Mr. Gary Nelson
Community Antenna Co. (Reno)

Mr. S. Renshaw
ATC-CATV, Inc. (Fallon)

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Mr. Edward Lee
Tonopah TV

Mr. Ron Lari
Tahoe Systems, Inc.

Mr. Fred Smith
Nevada Cablevision Co.

STATE UTILITY ENVIRONMENTAL PROTECTION ACT

An Act to provide for the regulation of the location, operation and maintenance of utility generation and transmission facilities to promote reliable, abundant and economical utility services with due regard for the preservation and enhancement of the environment and conservation of scenic, historic, recreational and other natural resources; and for other purposes.

BE IT ENACTED BY THE LEGISLATURE OF THIS STATE:

Section 1. Short title -- This Act shall be known, and may be cited, as the "Utility Environmental Protection Act".

Section 2. Declaration of public policy -- The Legislature hereby finds and declares that there is at present and will continue to be a growing need for electric, gas, telephone, telegraph, water and CATV utility services which will require the construction of new facilities. It is recognized that such facilities cannot be built without in some way affecting the physical environment where such facilities are located. The Legislature further finds that it is essential in the public interest to minimize any adverse effect upon the environment and upon the quality of life of the people of the State which such new facilities might cause. The Legislature further finds that present laws and practices relating to the location of such utility facilities should be strengthened to protect environmental values and to

take into account the total cost to society of such facilities. Furthermore, the Legislature finds that existing provisions of law may not provide adequate opportunity for individuals, groups interested in conservation and the protection of the environment, State and regional agencies, local governments, and other public bodies to participate in any and all proceedings before the Public Service Commission regarding the location and construction of major facilities. The Legislature, therefore, hereby declares that it shall be the purpose of this Act to provide a forum for the expeditious resolution of all matters concerning the location and construction of electric, gas, telephone, telegraph, water and CATV transmission lines and associated facilities.

Section 3. Definitions -- The following words, when used in this Act, shall have the following meanings, unless otherwise clearly apparent from the context:

(a) The word "Commission" shall mean the Public Service Commission of Nevada;

(b) The words "utility facility" shall mean:

1. Electric generating plants and associated facilities;
2. Electric transmission lines and associated facilities of a designed capacity of 12 kilovolts or more, and not subject to undergrounding by local ordinances;
3. Gas transmission lines, storage plants, compressor stations and associated facilities;

4. Telephone, telegraph and CATV equipment buildings, sites, and associated facilities;
5. Water storage and transmission facilities;
6. Sewer transmission and treatment facilities.

(c) The words "commence to construct" shall mean any clearing of land, excavation, or other action that would adversely affect the natural environment of the site or route of a utility facility, but does not include changes needed for temporary use of sites or routes for non-utility purposes, or uses in securing geological data, including necessary borings to ascertain foundation conditions;

(d) The word "person" shall include any individual, group, firm, partnership, corporation, cooperative, association, government subdivision, government agency, local government, or other organization;

(e) The words "local government" shall mean any county, municipality, district, agency or other unit of local government;

(f) The words "public utility" or "utility" shall mean any electric, gas, telephone, telegraph, water, sewerage or CATV utility possessing a Certificate of Public Convenience and Necessity from the Commission.

Section 4. The permit -- (a) No person shall hereafter commence to construct a utility facility in the State without first having obtained a permit therefor from the Commission. The replacement of an existing facility with a like facility, as determined by the Commission, shall not constitute construction of a utility facility. Any facility, with respect to which a permit

is required, shall thereafter be constructed, operated and maintained in conformity with such permit and any terms, conditions and modifications contained therein. A permit may only be issued pursuant to this Act; provided, however, any authorization relating to a utility facility granted under other laws administered by the Commission shall constitute a permit hereunder if the requirements of this Act have been complied with in the proceedings leading to the granting of such authorization.

(b) A permit may be transferred, subject to the approval of the Commission, to a person who agrees to comply with the terms, conditions and modifications contained therein.

(c) This Act shall not apply to any utility facility:

1. For which, prior to the effective date of this Act, an application for the approval of same has been made to any Federal, State, regional or local governmental agency, which possesses the jurisdiction to consider the matters prescribed for finding and determination in Subsection (a) of Section 8 of this Act;
2. For which, prior to the effective date of this Act, a governmental agency has approved the construction of same and such utility has incurred indebtedness to finance all or part of the cost of such construction; or
3. Over which an agency of the Federal Government has exclusive jurisdiction.

(d) Any person intending to construct a utility facility excluded from this Act pursuant to Paragraphs 1 or 2 of Subsection (c) of this Section may elect to waive such exclusion by delivering notice of such waiver to the Commission. This Act shall thereafter apply to each such utility facility identified in such notice from the date of its receipt by the Commission.

Section 5. Application for permit -- (a) An applicant for a permit shall file with the Commission an application, in such form as the Commission may prescribe, containing the following information:

1. A description of the location and of the utility facility to be built thereon;
2. A summary of any studies which have been made of the environmental impact of the facility;
3. A statement explaining the need for the facility;
4. A description of any reasonable alternate location or locations for the proposed facility, a description of the comparative merits or detriments of each location submitted, and a statement of the reasons why the primary proposed location is best suited for the facility; and
5. Such other information as the applicant may consider relevant or as the Commission may by regulation or order require. A copy or copies of the studies re-

ferred to in clause 2 above shall be filed with the Commission and be available for public inspection.

(b) Each application shall be accompanied by proof of service of a copy of such application on the clerk of each local government in the area in which any portion of such facility is to be located, both as primarily and as alternatively proposed.

(c) Each application shall also be accompanied by proof that public notice thereof was given to persons, residing in the municipalities entitled to receive notice under Subsection (b) of this Section, by the publication of a summary of the application in newspapers published and distributed in the area in which such utility facility is proposed to be located.

Section 6. Hearing on application for permit -- Upon the receipt of an application complying with Section 5, the Commission shall promptly fix a date for the commencement of a public hearing thereon and shall conclude the proceeding as expeditiously as practicable. The conduct of the hearing shall be the same as set forth in the applicable Rules of Practice and Procedure before the Commission.

Section 7. Parties to permit proceedings -- (a) The parties to a permit proceeding shall include:

1. The applicant;
2. Each local government and state agency entitled to receive service of a copy of the application under Subsection (b) of Section 5 of this Act, if it has

filed with the Commission a notice of intervention as a party, within thirty days after the date it was served with a copy of the application; and

3. Any person residing in a local government entitled to receive service of a copy of the application under Subsection (b) of Section 5 of this Act if such a person has petitioned the Commission for leave to intervene as a party, within thirty days after the date of the published notice and if such petition has been granted by the Commission for good cause shown.
4. Any domestic non-profit corporation or association, formed in whole or in part to promote conservation of natural beauty, to protect the environment, personal health or other biological values to preserve historical sites, to promote consumer interests, to represent commercial and industrial groups, or to promote the orderly development of the areas in which the facility is to be located, if it has filed with the Commission a notice of intent to be a party, within thirty days after the date of the published notice.

(b) Any person may make a limited appearance in the proceeding by filing a statement of position within thirty days after the date of the published notice. A statement filed by a person making a limited appearance

shall become part of the record. No person making a limited appearance shall have the right to present oral testimony or cross examine witnesses.

(c) The Commission may, for good cause shown, grant a petition for leave to intervene as a party to participate in subsequent phases of the proceeding, filed by a municipality, government agency, person or organization who is identified in Paragraphs (2) or (3) of Subsection (a) of this Section, but who failed to file a timely notice of intervention or petition for leave to intervene, as the case may be.

Section 8. The decision -- (a) The Commission shall render a decision upon the record either granting or denying the application as filed, or granting it upon such terms, conditions or modifications of the construction, operation or maintenance of the utility facility as the Commission may deem appropriate. The Commission may not grant a permit for the construction, operation and maintenance of a utility facility, either as proposed or as modified by the Commission, unless it shall find and determine:

1. The basis for the need of the facility;
2. The nature of the probable environmental impact;
3. That the facility represents the minimum adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives, and other pertinent considerations;
4. That the location of the facility as proposed conforms

to applicable State and local laws and regulations issued thereunder;

5. That the facility will serve the public interest.

(b) If the Commission determines that the location of all or a part of the proposed facility should be modified, it may condition its permit upon such modification.

(c) A copy of the order and any opinion issued therewith shall be served upon each party.

Section 9. Rehearing; judicial review -- (a) Any party aggrieved by any order issued on an application for a permit may apply for a rehearing within fifteen days after issuance of the order. Any party aggrieved by the final order of the Commission on rehearing may obtain judicial review thereof by filing of a Complaint in a State District Court within thirty days after the issuance of such final order. Upon receipt of such Complaint, the Commission shall forthwith deliver to the court a copy of the written transcript of the record of the proceeding before it and a copy of its decision and opinion entered therein which shall constitute the record on judicial review.

(b) The grounds for and the scope for review of the court shall be limited to whether the opinion and order of the Commission is:

1. In conformity with the constitution and the laws of the State of Nevada and of the United States;
2. Supported by substantial evidence in the record;
3. Made in accordance with the procedures set forth in

this Act or established order, rule or regulation of the Commission; and

4. Arbitrary, capricious or an abuse of discretion.

Section 10. Joint hearings and orders -- The Commission, in the discharge of its duties under this Act or any other Act, is authorized to make joint investigations, hold joint hearings within or without the State, and issue joint or concurrent orders in conjunction or concurrence with any official or agency of any State or of the United States, whether in the holding of such investigations or hearings, or in the making of such orders, the Commission shall function under agreements or compacts between States or under the concurrent power of States to regulate interstate commerce, or as an agency of the United States, or otherwise. The Commission, in the discharge of its duties under this Act, is further authorized to negotiate and enter into agreements or compacts with agencies of other States, pursuant to any consent of Congress, for cooperative efforts in permitting the construction, operation and maintenance of utility facilities in accord with the purpose of this Act and for the enforcement of the respective State laws regarding same.