

NATIONAL SAFETY COUNCIL

**A HISTORY of THE COMMITTEE ON ALCOHOL
AND OTHER DRUGS (CAOD)**



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COMMITTEE ON ALCOHOL AND OTHER DRUGS
COMMITTEE CHAIR HISTORY 1936-2004

Term of Chair starts in October until 2004 when term beginning changed to February.

1936	Arthur Roth, Captain Department of Public Safety Cleveland, Ohio	1967-69	Morton F. Mason, Director Criminal Investigation Lab Dallas, Texas
1937-38	Harry H. Porter Chief Justice Municipal Court Evanston, Illinois	1969-71	Kurt M. Dubowski, Professor University of Oklahoma Medical Center Oklahoma City, Oklahoma
1939-44	Don F. Stiver, Director Department of Public Safety Indianapolis, Indiana	1971-73	Richard W. Prouty Chief Forensic Toxicologist Office of Chief Medical Examiner Oklahoma City, Oklahoma
1945-58	Mason Ladd, Dean University of Iowa Law School Iowa City, Iowa	1973-75	Robert H. Reeder, General Counsel Traffic Institute Evanston, Illinois
1959-61	James P. Economos, Director Traffic Court Program American Bar Association Chicago, Illinois	1975-77	J.D. Chastain, Director Scientific Testing Program Department of Public Safety Austin, Texas
1961-63	Robert B. Forney, Professor Indiana University Medical School Indianapolis, Indiana	1977-79	Douglas M. Lucas, Director Centre of Forensic Sciences Toronto, Ontario, Canada
1963-65	H. Ward Smith, Director Attorney General's Laboratory Toronto, Ontario, Canada	1979-81	Lowell C. Van Berkomp State Crime Laboratory St. Paul, Minnesota
1965-67	Robert F. Borkenstein Professor Indiana University	1981-83	Bryan S. Finkle Genentech, Inc. South San Francisco,

Bloomington, Indiana

- 1983-85 George E. Brown
Alcohol Testing Program
Department of Public Safety
Austin, Texas
- 1985-87 Brian O'Neill
Insurance Institute for
Highway Safety
Washington, D.C.
- 1987-89 Eldon Ukestead, For. Scientist
Bureau of Criminal
Apprehension
St. Paul, Minnesota
- 1989-91 Sharon Franklin, Assoc. Dir.
Alcohol Abuse Deterrent Prog
Duemling Clinic
Fort Wayne, Illinois
- 1991-93 Yale H. Caplan, Director
National Center for Forensic
Science
Baltimore, Maryland
- 1993-95 J. Robert Zettl, Supervisor
Alcohol Test Unit
Dept. Public Health &
Environment
Denver, Colorado
- 1995-97 Dennis Bryde, Director
Alcohol Training and
Research
Michigan State University
East Lansing, Michigan
- 1997-99 Boris Moczula
Chief, Appellate Bureau
Hughes Justice Complex
Trenton, New Jersey

California

- 1999-2001 Robert B. Forney, Jr.
Professor of Pathology
Medical College of Ohio
Toledo, Ohio
- 2001-04 Patrick Harding
Toxicology Supervisor
WI State Lab of Hygiene
Madison, Wisconsin
- 2004- Shirley G. Ezelle
Service Unit Leader
Arkansas Dept. of Health
Little Rock, Arkansas

COMMITTEE ON ALCOHOL AND OTHER DRUGS
COMMITTEE SECRETARY HISTORY 1935-1995

1935-43	Donald S. Berry
1944	H.D. Booth
1945	James D. Hill
1946	Donald S. Berry
1947	David Baldwin
1948-49	Jack D. Whittall
1950-51	Glenn M. Schultz
1952-55	Robert E. Schmal
1956-57	Raymond C. Hill
1958	Edwin F. South
1959-66	Donald C. Lhotka
1967-69	Donald L. Anderson
1970-71	Michael T. Impellizzeri
1972	Keith A. Ritchie
1973-75	Elbert Hugunin
1976-78	Donald C. Lhotka
1979	Al Lauersdorf (Staff Representative)
1980-95	Edgar W. Kivela
1995-	Chester Flaxmeyer

Robert F. Borkenstein Award Recipients

Presented by the
**NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS**

1989	Robert F. Borkenstein
1990	Robert B. Forney, Sr.
1991	Edgar W. Kivela
1992	Kurt M. Dubowski
1993	Robert W. Reeder
1994	Ralph Turner
1995	Bryan S. Finkle
1996	William R. Picton
1997	Douglas M. Lucas
1998	Lowell C. Van Berkom
1999	J. Robert Zettl
2001	No Awardee
2002	No Awardee
2003	No Awardee
2004	Alan Wayne Jones

**NATIONAL SAFETY COUNCIL
ROBERT F. BORKENSTEIN AWARD**

PURPOSE	To recognize individuals who have made outstanding contributions through a lifetime of service consistent with the ideals and achievements of Dr. Robert Frank Borkenstein. These contributions will be in the area of alcohol/drugs in relation to traffic and transportation safety.
SPONSOR	Highway Traffic Safety Division of the National Safety Council
QUALIFICATIONS	Persons nominated must, through a minimum tenure of twenty-five years of active service in the field of alcohol/drugs and traffic safety, have contributed to that field to a degree that their achievements have been nationally recognized. A minimum of ten years of active and productive involvement as a volunteer with the National Safety Council must be shown. Career contributions will have been in one of the following areas: (1) alcohol education; (2) legal matters; (3) alcohol related cases; (4) human factors – the involvement in scientific research and studies of alcohol and the medical/physiological/psychological aspects of alcohol and traffic safety; (5) technology-toxicological procedures involving alcohol/drugs and development and evaluation of techniques; and (6) action programs – law enforcement, legislation, public information, intervention efforts, and other social factors related to alcohol/drugs and traffic safety.
RULES	Nominations must be submitted to the Highway Traffic Safety Division through its Committee on Alcohol and Other Drugs at the National Safety Council Headquarters by April 1 of the year in which the award is to be granted. Nominations may be submitted by any individual, committee, agency or organization. Each nomination received will be reviewed by the Division's Awards Committee for appropriateness and qualifications. The Awards Committee will make recommendations to the Division's Executive Committee, which will make final approval. Nominations must be made on the appropriate form available from the National Safety Council's Traffic Division. Only one award recipient will be designated in a year. Awards may or may not be granted each year. The Executive Committee of the Highway Traffic Safety Division will approve the granting of awards.
PRESENTATION	The award winner will be recognized at the annual meeting of the Committee on Alcohol and Other Drugs or an affair attendant to such annual meeting.
PUBLICITY	Publicity for the award will be provided by the Council's Public Relations Department.

STORY of COAD

NATIONAL SAFETY COUNCIL'S COMMITTEE ON ALCOHOL AND OTHER DRUGS

Introduction

The Committee on Alcohol and Other Drugs, first known as the Committee on Tests for Intoxication, was established in the National Safety Council in 1936. From that time, the Committee has been active in making recommendations for the control of the drinking-driving problem, including legislation, enforcement, education, chemical testing equipment, training of testing personnel, and other aspects of alcohol countermeasures programs. Its role had been limited to developing recommendations and standards, but its members have been active in assisting in many aspects of programs designed to reduce the drinking-driving problem. In fact, many of the members, past and present, have been directly involved as officials in programs.

There have been numerous contributions by individual members of the Committee, such as the development of breath testing devices and methods for blood and urine tests that have been widely used. These contributions, which include numerous scientific articles and papers on the subject of chemical tests, have added greatly to the total sum of knowledge in this important scientific effort.

This report attempts to present in condensed form most of the recommendations, standards, and work of the Committee for the past six decades.

Report On Activities - 1936 - 1958

1936 was the founding year for the Committee. Although a preliminary meeting was held in October 1935 and there were some discussions of the drinking-driving problem, no actions were taken.

In **1937**, a "Motor Vehicle Intoxication Report" form was developed for use by the investigating officers and examining physicians to record the results of the examination of the drinking driver. Also, the first Committee progress report was prepared and presented at the 26th National Safety Congress. It contained several recommendations dealing with intoxication examination, officer training, use of intoxication examination report, educational and enforcement methods, and public information on the hazards of driving after drinking. The most important was that chemical tests of body fluids or breath be used to supplement the testimony of a police officer or physician examination for the determination of intoxication in drinking and driving cases.

The Committee recognized the need for more information of the effects of alcohol in the human body as it related to driver impairment and made plans for reviewing the available information, urging that a study and evaluation of available test methods be made. The Committee outlined its scope of activity and objectives as follows:

- To study the usefulness of physical and chemical tests by officers and/or medical men concerning their accuracy, practicality and effectiveness in securing convictions.
- To determine whether chemical tests are generally needed as a supplement to physical tests.
- To study and prepare a definition for the phrase "under the influence" for drinking drivers.
- To study, prepare and recommend general procedures for obtaining convictions, including a study of court procedures.
- To make a thorough study of the problem of alcohol as it relates to traffic accidents and to recommend improvements in methods for dealing with drinking drivers and pedestrians.

The year **1938** was highlighted by the collaboration with a special committee of the American Medical Association (Committee to Study Problems of Motor Vehicle Accidents) in establishing the following chemical standards for the legal interpretation of "under the influence of alcohol" in terms of the percentage of alcohol in the blood or its equivalent in other body materials:

- **Below 0.05** percent alcohol in the blood: no influence of alcohol within the meaning of the law.
- **Between 0.05 and 0.15** percent, a liberal, wide zone: alcoholic influence usually is present, but courts of law are advised to consider the behavior of the individual and circumstances leading to the arrest in making their decision.
- **0.15 percent:** definite evidence of "under the influence", since every individual with this concentration would have lost to a measurable extent some of the clearness of intellect and control of himself that he would normally.

These recommended blood alcohol levels later formed the basis for the Chemical Tests Section of the Uniform Vehicle Code, published by the National Committee on Uniform Traffic Laws and Ordinances.

Committee members studied reports from foreign countries on the use of chemical tests and the degree of alcohol involvement in traffic accidents. The results of the studies were given wide distribution in the United States.

The Committee's report to the 27th National Safety Congress contained a detailed report on chemical tests for intoxication, including blood, urine, saliva, breath and spinal fluid. Test methods included the Heise Test, Widmark Micro-Method, Friedemann's Method, Harger

Micro-Method, Harger Breath Test and the Muehtberger Test. A major recommendation suggested the general adoption of the Arizona definition of "under the influence" as the first step in improving legal definitions. It specified:

"The expression '*under the influence if intoxication liquor*' covers not only all the well-known and easily recognized conditions and degrees of intoxication, but any abnormal mental and physical condition which is the result of indulging in any degree to intoxicating liquors, and which tends to deprive him of that clearness of intellect to control himself which he would otherwise possess. If the ability of the driver of an automobile has been lessened in the slightest degree by the use of intoxicating liquors, then the driver is deemed to be under the influence of intoxicating liquor. The mere fact that the driver has taken a drink does not place him under the ban of the statute unless such drink has some influence upon him lessening in some degree his ability to handle said automobile."

In **1939**, the Committee assisted officials in Indiana and Maine in the development of legislation dealing with the use of evidence obtained through chemical tests for alcoholic intoxication. The Indiana law was passed in March 1939 and the Maine law in April 1939. The wording of the Indiana law was suggested as a model:

"If it is alleged in the indictment or affidavit, or upon trial, that the defendant was under the influence of intoxicating liquor when he committed reckless homicide, or that he was under the influence of intoxicating liquor when he drives a vehicle, the court may admit evidence of the amount of alcohol in the defendant's blood at the time alleged, as shown by a chemical analysis of his breath, urine or other bodily substance. Such evidence may be accompanied by other relevant evidence such as eyewitness testimony about defendant's appearance, speech and conduct at the time alleged. Evidence that there was, at the time, five hundredths percent, or less, by weight of alcohol in his blood, is prima facie evidence that the defendant was not under the influence of intoxicating liquor sufficiently to lessen his driving ability within the meaning of the statutory definitions of the offense. Evidence that there was, at the time, from five hundredths percent to fifteen hundredths percent by weight of alcohol in his blood, is relevant evidence but is not to be given prima facie effect in indicating whether or not the defendant was under the influence of intoxicating liquor within the meaning of this act. Evidence that there was, at the time fifteen hundredths percent, or more, by weight of alcohol in his blood, is prima facie evidence that the defendant was under the influence of intoxicating liquor sufficiently to lessen his driving ability within the meaning of statutory definitions of the offenses."

The Committee revised the "Motor Vehicle Intoxication Report" form developed two years previously and renamed it the "Alcoholic Influence Report Form".

The Committee's 1939 report to the 28th National Safety Congress presented a detailed

outline on installing tests for intoxication, including model legislation, current testing programs, report forms, training of personnel and step-by-step methods in setting up a testing program.

During **1940**, the Committee considered actions aimed at reducing the offenses of driving and walking in traffic while under the influence of intoxicating liquor. These recommendations applied to enforcement, education, legislation and public support efforts.

The Committee developed, and the National Safety Council distributed, a sound film entitled "Testing the Drinking Driver" which encouraged the use of scientific tests to measure blood alcohol concentrations. The film presented desirable methods to use in obtaining evidence for trials involving the drinking driver.

The Committee's **1940** report to the 29th National Safety Congress covered alcohol as a factor in traffic accidents, handling intoxicated pedestrians, use of test methods, education and training, compulsory tests, alcohol tolerance and the specificity of chemical tests.

The Committee recommended that there should be a state law or city ordinance providing a definite minimum penalty for a pedestrian under the influence of intoxicating liquor while in a crosswalk or on a street or highway.

In **1941 and 1942**, materials developed by the Committee for better control of the drinking driver were in wider use by states and cities, and Committee recommendations were more widely accepted and used in traffic accident prevention programs.

A major effort of the Committee during this period was the drafting of legislation dealing with chemical tests for intoxication, based on the Indiana law, for state use and submission to the National Committee on Uniform Traffic Laws and Ordinances.

Also, the Committee studied the seriousness of the impact of the drinking driver and pedestrian on the war effort, urged wider acceptance of the chemical tests, and recognized the demands of the war effort on National Safety Council staff and Committee members which would curtail their efforts to deal with the alcohol in traffic problem.

During **1943**, the final draft of the "Model Legislation on Driving Under the Influence" was completed and submitted to the National Committee on Uniform Traffic Laws and Ordinances.

The opinions of courts of last resort on the subject of chemical tests were given wide publicity by the Committee members.

The legal questions on the use of Chemical tests were analyzed by Committee members with legal experience and their findings were made available to police, courts, medical men and prosecuting attorneys.

1944 was a banner year for the Committee. First, its model law on driving while under the

influence was adopted by the National Committee on Uniform Traffic Laws and Ordinances on October 12 for inclusion in the Uniform Vehicle Code.

Secondly, the Committee developed two guides which, were published by the National Safety Council:

- Public Safety Memo No. 30, "Setting Up Chemical Tests for Intoxication". This guide outlined to public officials the necessary steps to be taken before initiating a chemical testing program in the state or community.
- Public Safety Memo No. 29, "Instructions for Examining Drinking Drivers". This guide outlined the step-by-step procedures to be followed in examining the driver believed to be under the influence of intoxicating liquor.

Adoption of chemical tests by the Armed Forces further validated the use of such tests to determine the degree of intoxication in drivers and others.

During **1945**, the Committee was expanded to 33 members. The question of compulsory tests was raised and several legal studies were made of the "self-incrimination" aspects of compulsory testing of drivers believed to be under the influence of intoxicating liquor. Most legal authorities agreed that the prohibition of "self-incrimination" referred to testimony of the defendant and not to the right of enforcement officials to examine the body of the defendant, including examination of breath and body fluids.

During **1946**, the Committee reviewed and gave wide publicity to the report of Sweden's Dr. Leonard Goldberg, "Quantitative Studies of Alcohol Tolerance in Man". This report, published in 1943, was recognized as the best study that had been developed up to that time on the relationship between blood alcohol and impaired ability.

More cities and states reported the use of chemical tests as an aid to the identification and prosecution of drivers under the influence of intoxicating liquors in 1946 than in any other previous year. Reports to the National Safety Congress (conducted annually by the National Safety Council) indicated that chemical tests were used in 72 cities and by 18 state enforcement agencies.

However, limitations on chemical test equipment were reported. The Committee recommended that steps be taken, as rapidly as possible, to make available to enforcement agencies equipment for making chemical tests for intoxication.

In **1947**, the Committee studied the need for more trained technicians to expand the use of chemical tests by enforcement agencies. The need for a special grant of funds was discussed regarding a comprehensive study of alcohol tolerance, a study of the reliability of test methods in use, and more training for chemical test technicians.

1948 was the first year in which some Committee activities were supported with special grants. The Licensed Beverage Industries, Inc., concerned with curbing the drinking driver, granted funds to the National Safety Council for Committee use in researching chemical

tests, promoting training in chemical test procedures, and encouraging legislation on driving while under the influence of intoxicating liquor, including wider use of tests in drinking driver control programs.

The grant of funds permitted the development of three activities:

- A research project to determine the reliability of the different test methods (Alcometer, Drunkometer, and Intoximeter) which was awarded to Michigan State College, to be carried out by graduate students under the direction of Professor Ralph Turner.
- A training project for the training of technicians and police officers in chemical test procedures was awarded to the Northwestern University Traffic Institute.
- Appointment of a full-time secretary to provide liaison with college and universities offering chemical test training to enforcement officers.

By 1948, ten states had enacted legislation that was in substantial accord with the chemical test provisions of Act V of the Uniform Vehicle Code.

1949 saw the renewal of the 1948 grant which permitted expansion of the training program for chemical test technicians by the Traffic Institute and continuation of the Michigan State College research project on the comparability and reliability of the various chemical test methods.

A special technical subcommittee was appointed to resolve the highly important question of the alcohol partition ratio between blood and breath. Also, three subcommittees were established to further Committee work. These were: Legal Problems; Visual Aids; and Training.

A monthly Committee newsletter, "Test Talk", reached a circulation of 2,000 including 1,100 to enforcement agencies, 250 to safety councils and 400 to individuals in the medical field. **1950** saw the completion of the research project at Michigan State on the comparability and reliability of chemical tests in which 1,200 analyses were made involving tests of breath, blood and urine for alcohol concentrations. Assuming competent analytical technique, the methods studied indicated a satisfactory percentage of alcohol recovery to establish blood alcohol concentration.

Researchers studied three devices for blood alcohol determination by analysis of the breath: the *Drunkometer*, *Intoximeter* and *Alcometer*. The blood alcohol determinations obtained through the use of these breath testing devices were in close agreement with results obtained by direct analysis of the blood.

In **1951**, the Committee had more than 50 members who showed keen interest in medico-legal aspects of chemical tests. At the annual meeting during the 40th National Safety Congress, there was considerable discussion about the need for a comprehensive manual on chemical tests.

The year **1952** yielded the results of the special technical subcommittee study of alcohol partition ratio between blood and breath. The subcommittee prepared the following statement which was approved by the membership of the Committee on Tests for Intoxication:

"The basic principle governing the operation of the three presently used breath test methods (the Drunkometer, the Intoximeter and the Alcometer) is the constant ratio existing between the concentration of alcohol in the alveolar air and the blood. Available information indicates that this alveolar air blood ratio is approximately 1:2100. However, since each method involves different procedures, different empirical factors are involved in the calculations of alcohol in the blood in each of the methods.

"It is the opinion of the subcommittee that tests made on the Alcometer, the Intoximeter and the Drunkometer, if conducted in the manner prescribed by the authors of the respective methods, will give comparable and reliable results for estimating the concentration of alcohol in the blood."

This was also the year in which attention was first given to the "Active Consent" provision for state laws. This was later known as "**Implied Consent**". The following resolution was approved by the Committee members and forwarded to the National Committee on Uniform Traffic Laws and Ordinances:

"RESOLVED, that the Committee on Tests for Intoxication of the National Safety Council go on record as recommending to the various state legislatures that their drivers' license act be amended to provide that, as a condition precedent to a driver's license being issued by the state, an applicant for such license shall be required to agree to take a chemical test in any case in which he is suspected of driving under the influence of intoxicating liquor and that refusal on his part in such case to submit breath for chemical analysis to determine alcoholic influence shall be grounds for automatic mandatory revocation of his license.

"BE IT FURTHER RESOLVED, that the above provision be incorporated in Article II of the Uniform Vehicle Code."

A special committee was appointed to work with the Committee on Medico-Legal Problems in the development of a chemical test manual for the American Medical Association.

1953 saw the enactment of the first Implied Consent law by the State of New York, based on the 1952 resolution of the Committee on Tests for Intoxication dealing with chemical testing as a condition precedent to the issuance of a driver's license.

"Evaluating Chemical Tests for Intoxication" was published for the Committee by the National Safety Council. It contained the report of the Michigan State College research project on the comparability and reliability of chemical tests for intoxication. This report also contained the

recommendation regarding the blood-breath alcohol ratio.

In **1954**, a total of 45 states and 464 jurisdictions of 10,000 population or more were reported to be using chemical tests to determine blood alcohol concentrations. A total of 18 states had passed chemical test statutes.

Committee member R. F. Borckenstein demonstrated his newly developed breath test device for blood alcohol concentrations, *the Breathalyzer*, at the annual meeting.

During **1955**, the members of the Committee continued to advocate broader chemical test use. At the annual meeting, special attention was given to the progress being made in New York State with the "Implied Consent" provision. The subcommittee on Legal Matters was urging documentation of cases carried to higher courts, especially those cases involving "Implied Consent".

1956 brought the first recorded discussion by Committee members of the need to look into the influence of drugs on driving behavior.

The Committee recommended a revision for the Uniform Vehicle Code which stated:

"Upon the trial of any action or proceeding arising out of acts alleged to have been committed by any person while driving or in actual physical control of a vehicle while under the influence of intoxicating liquor, evidence of the amount of alcohol in the person's blood at the time of the act alleged as shown by a medical or chemical analysis of his breath, blood, urine, saliva or other bodily substance is admissible, and the result of any such analysis shall give rise to the following presumptions:

- If there was 0.05 percent or less by weight of alcohol in the person's blood, it shall be presumed that such person was not under the influence of intoxicating liquor.
- If there was in excess of 0.05 percent but less than 0.15 percent by weight of alcohol in the person's blood, such fact shall not give rise to any presumption that the person was or was not under the influence of intoxicating liquor, but such fact may be considered with other competent evidence in determining whether such person was under the influence of intoxicating liquor.
- If there was 0.15 percent or more by weight of alcohol in the person's blood, it shall be presumed that such person was under the influence of intoxicating-liquor.
- The foregoing provisions of this subsection shall not be construed as limiting the introduction of any other competent evidence bearing upon the question whether or not such person was under the influence of

intoxicating liquor."

During **1957**, much of the Committee members' previous work began to bear fruit. The U. S. Supreme Court held that chemical analysis of blood for determining intoxication is a scientifically accurate method of detecting alcoholic content and furnishes an exact measure upon which to base a decision as to intoxication (*Breithaupt vs. Abram*, 352 U.S. 432, 1957). The American Medical Association began publishing the manual on *Chemical Tests for Intoxication*¹ and a new book entitled *Chemical Tests and the Law*² was published by the Traffic Institute.

At its annual meeting, the Committee approved the "Uniform Chemical Test for Intoxication Act" prepared by the National Conference of Commissioners on Uniform State Laws.

1958 marked a turning point for the Committee on Tests for Intoxication. The members voted to reconstitute and reorganize the Committee and to redefine its objectives. The annual meeting of the Committee also recorded the first discussion of the "absolute" or "per se" concentration for blood alcohol concentration in determining legal impairment of drivers, rather than using the presumption of intoxication at the recognized concentration of alcohol.

1 "Chemical Tests for Intoxication", Committee on Medieolegal Problems, American Medical Association, Chicago, IL, 1957. 2 Robert L. Donigan, "Chemical Tests and the Law", Traffic *Institute*, Northwestern University, Evanston, IL, 1957.

2 Robert L. Donigan, *Chemical Tests and the Law*, Traffic Institute, Northwestern University, Evanston, IL, 1957.

A New Era -- 1959-2004

In February, **1959**, members approved a reorganization and selected a name to characterize its redefined mission. The name was: Committee on Alcohol, Drugs and Traffic Safety. The name was later shortened to Committee on Alcohol and Drugs by the NSC Traffic Conference under which the group has served as a standing committee since that time.

In addition to carrying out its reorganization, the Committee began two special projects during the year. The first was the study of specifications and needs for a new Alcoholic Influence Report Form. The second dealt with the need for specifications in training and certification of breath test technicians.

1960 brought the expansion of Committee membership to a total of 87 members. A special subcommittee was appointed to study the lowering of the blood alcohol concentration prescribed in state statutes for determining under the influence. The full Committee approved the following at its annual meeting on October 20.

"It is therefore recommended that the Committee on Alcohol and Drugs of the National Safety Council urges the state legislatures, when amending or enacting chemical test laws, to establish the three blood alcohol level zones at zero to 0.05%; 0.05% to 0.10%; 0.10% and above."

The recommendation was approved by the Council's Traffic Conference and forwarded to the National Committee on Uniform Traffic Laws and Ordinances for amendment of the Uniform Vehicle Code. The UVC was officially amended in 1962.

A study was recommended of the use of a special report of alcohol involvement in fatal motor vehicle traffic accidents.

In **1961**, a revised model Alcoholic Influence Report Form was approved and a pilot study was recommended to determine its effectiveness. The results of a survey of drug incidence in chemical test programs were reviewed and it was recommended that local agencies be advised to monitor drug involvement in apparent intoxication cases.

Twenty-five Committee members participated in a National Conference on Alcohol and Traffic Safety sponsored by the U.S. Public Health Service. This was the first instance in which a federal agency had expressed major interest in this field.

The annual meeting of the Committee in **1961** marked the **25th Anniversary** of its operation. Five members were honored for their service to the Committee, which began in 1936. These were: T. Friedemann; R. Harger; H. Heise; C. Muehlberger; and H. Porter.

During **1962**, the Committee urged that the Council's General Aviation Safety Committee consider the problem of alcohol involvement in private aircraft crashes and offered the assistance of several members.

The Committee also approved a Standard Report of Alcohol Involvement in Fatal Motor Vehicle Traffic Accidents and suggested a study of its use and effectiveness.

In **1963**, pilot studies of the Standard Report of Alcohol in Fatal Motor Vehicle Traffic Accidents were conducted in several counties in California. It was shown that the form was an effective instrument to obtain data on alcohol's role in fatal crashes.

The Committee began discussions on the need for statewide control of chemical test programs on the impact of public education and information programs.

During **1964**, a special subcommittee began drafting a model program on state control of chemical tests. The Public Information Subcommittee was given the task of looking at the whole issue of public education and information.

1965 saw many members of the Committee busily preparing for the 4th International Conference on Alcohol and Traffic Safety to be held in Bloomington, Indiana. The annual meeting of the Committee was held in conjunction with the International Conference.

A summer workshop was held at Rutgers University by an ad hoc committee to consider public education needs in alcohol and traffic safety. The basic work of this group was presented to the members of the Committee and a special editorial committee was appointed to prepare recommendations.

The year **1966** was dedicated to a reorganization of the subcommittee structure of the Committee. The number was increased from four to nine and they were designed to correspond with the working parties of the International Committee on alcohol and Traffic Safety. The areas covered were:

- Research
- Analytical Methods
- Law Enforcement Aspects
- Training
- Medical-Pharmacological Matters
- Standard Reporting.

Public education was still the prime concern of the Committee at its meeting during the year. Efforts were begun to develop a joint national educational campaign with the Public Health Service and the American Medical Association. Late in 1966 the U.S. Congress passed a Highway Safety Act which brought the federal government into the field on a broad basis.

During **1967**, the Committee finalized its recommendations for a "Model Program for the Control of Alcohol for Traffic Safety" which had been requested by the National Highway Safety Bureau (later the National Highway Traffic Safety Administration), U.S. Department of Transportation, then headed by Committee member William Haddon, M.D.

A Public Information Seminar was sponsored by the subcommittee on this subject and the

recommendations developed at the seminar were turned over to the Council's Public Information Conference for action.

In **1968**, an ad hoc committee was established to develop recommendations on testing and training as related to chemical test aspects of a jurisdiction's program to control drinking drivers. Late in the year the report was tentatively approved, with certain recommended changes to be added.

Early in **1969**, the recommendations of the ad hoc Committee on Testing and Training were finally approved. By the end of 1969, 45 states had enacted some type of Implied Consent law and only one state, Mississippi, had not legislated some kind of chemical test law. Two states had not yet established statutory presumptive concentrations of blood alcohol. One state, Utah, had lowered its presumptive concentration to 0.08%.

1970 marked the developmental stage of demonstration projects on alcohol countermeasures through federal funding. Eight of the projects began in 1971 and eventually the program grew to 35 across the country. All of these demonstration projects were completed by the end of 1977. Several Committee members were deeply involved in these projects.

The Committee activities for 1970 included development of several reports concerning:

- the lowering of the blood alcohol presumptive level to 0.08%
- retraining and requalification of breath alcohol analysis technicians
- summarization of relevant information on the drugs and driving problem.

The year also saw the beginning of a national public service advertising campaign sponsored by the Council aimed at getting the "drunk driver" off the road.

During **1971**, the Committee took the position that a "concentration of 80 milligrams of ethanol per 100 milliliters of whole blood (0.08 percent w/v) in any driver of a motor vehicle is indicative of impairment in his driving performance". The Committee also adopted "Recommendation on Quantitative Breath Alcohol Instrumentation". These recommendations included standards for quantitative breath-alcohol analysis instruments and proposals for the training of state-level program directors and other personnel involved with breath-alcohol analysis programs.

Because of these actions, the Committee officially retired the booklet "Evaluating Chemical tests for Intoxication" to the status of historical document.

1972 brought another reorganization of the subcommittee structure in the Committee. The number was reduced to four and their titles were:

- (1) Analytical Methods
- (2) Human Factors
- (3) Law Enforcement and Legal Matters
- (4) Public Information, Education and Training.

The Committee also adopted a report entitled "Performance Standards for Breath Alcohol Screening Tests".

Illinois became the 50th state to enact an implied consent law. This action took place nearly 20 years after the Committee first considered such legislative matters.

An ad hoc committee with international representation met at Indiana University Law School to review the scientific data. The committee concluded that:

"Available information indicates that 2.1 liters of expired alveolar air contain approximately the same quantity of alcohol as 1 milliliter of blood. Continued use of this ratio in clinical and legal applications is warranted."

This statement was endorsed by the Executive Board of the National Safety Council's Committee on Alcohol and Other Drugs.

During **1973**, the Committee provided a special review for the National Bureau of Standards on a proposed "Performance Standard for Quantitative Breath Alcohol Measuring Instruments". Several members provided consultative service to the National Highway Traffic Safety Administration at a special meeting which dealt with analytical and legal constraints on standards for quantitative alcohol analysis.

This increased activity with the federal government prompted the signing of a contract between NHTSA and the National Safety Council, wherein Committee members were asked to perform special tasks related to alcohol countermeasures.

1974 saw the Committee once again in session during the 6th International Conference on Alcohol, Drugs, and Traffic Safety held in Toronto, Canada. At the Committee's annual meeting, a 38-year history was presented as seen through the eyes of a charter member, R.N. Harger.

Under the terms of the NSC-NHTSA contract, several Committee members conducted a Workshop on Research Methodology for Roadside Surveys on Drink-Driving. A thirty-minute film and manual were developed for the workshop. Other projects completed under the contract included: five literature reviews; two reviews of proposed standards; and a report on "Constitutional Protection of Convicted DWI Offenders Selected to Receive Special Sanctions". (DOT HS-801 231, National Technical Information Service, Springfield, VA, 22151, September, 1974.)

During **1975**, a report was issued on "Periodic Requalification and Continued Education and Training of Personnel Engaged in the Performance of chemical Tests for Alcoholic Influence".

A major task undertaken as a part of the NSC-NHTSA contract was the draft revision of the Highway Safety Program Manual, Volume 8, "Alcohol in Relation to Highway Safety". Other tasks included: (1) a review of the "Performance Standard for Screening Breath Alcohol Testers", (2) provide training on evaluation procedures, (3) provide on-site assistance in developing data for evaluation of screening breath testers, and (4) provide literature reviews in 5 areas.

The Committee approved a new definition of alcohol concentration for possible revision of the Uniform Vehicle Code.

"Alcohol concentration shall mean:

(1) grams of alcohol per 100 milliliters of blood

(2) grams of alcohol per 210 liters of breath."

The Committee also approved the following statement:

"Some issues have been raised in the California Supreme Court's decision in *People vs. Hitch* and allied cases in which the court held that chemicals and ampoules used in breath test cases must be preserved for possible pre-trial examination and analysis by defendants should they so demand it.

A review of the scientific merits of this position has been made. It is concluded that at the present time, a scientifically valid procedure is not known to be available for the reexamination of a Breathalyzer ampoule that has been used in the breath test for ethanol, in order to confirm the accuracy and reliability of the original breath analysis."

Activities in **1976** included the issuance of a report affirming that the Committee supports the continued use of 2100/1 factor for the conversion of the results of a breath-alcohol analysis to blood-alcohol concentration for law enforcement purposes.

The previous year, the Committee had recommended that the Council accept the publishing rights from the American Medical Association to the manual entitled "Alcohol and the Impaired Driver".³ The Council did republish the manual and the Committee was asked to consider production of a major revision of it. This process was begun at the end of 1976.

1977 marked 40 years since the Committee issued its first formal report on chemical tests for intoxication. The year also saw the 7th International Conference on Alcohol, *Drugs*, and Traffic Safety in Melbourne, Australia. During the conference, an Award of Merit from the International Committee was presented to the National Safety Council for its sustained support of activities in the field.

3. "Alcohol and the Impaired Driver" was originally published in hardcover in 1968 and republished in 1970 in softcover. A supplement, "Breath-Alcohol Tests", was published by the AMA in 1972. The two were combined and republished by the National Safety Council in 1976. Also during the year, the Committee reaffirmed its policy concerning the breath test ampoule preservation/reanalysis (Hitch Case); and, a reorganization of subcommittees was authorized to be based on functional rather than disciplinary lines.

1978 saw the Committee initiate a revised "functional" subcommittee structure creating the following subcommittees:

- (1) Education and Training
- (2) Human Factors
- (3) Technology
- (4) Legal Matters
- (5) Action Programs.

In **1979** the Committee reaffirmed its 1971 position with regard to acetone effect on breath alcohol testing. This position was:

"Substances which are produced endogenously and appear in the breath shall not contribute to the apparent blood alcohol concentration by more than 0.01%."

In **1980** the Committee voted to amend the 1974 standard for the retraining of breath test technicians in that renewal be for a period "not to exceed one year". The Committee also reaffirmed, as it had annually, the 1975 position on retesting of used breath test ampoules,

"... a scientifically valid procedure is not known to be available for the reexamination of a Breathalyzer ampoule that has been used., in order to confirm the accuracy and reliability of the original breath analysis."

In **1981**, the Committee reaffirmed its position, originally adopted in 1975, with regard to the retention of ampoules used in breath test cases for further analysis.

1982 saw the National Safety Council Highway Traffic Safety Division adopt a Committee recommendation on legal drinking age as a position statement:

"The National Safety Council strongly supports the adoption of a uniform legal minimum drinking age of 21 for all alcoholic beverages."

In **1983** actions of the Committee included adopting an operational statement on drugs other than alcohol and approving the training and certification recommendations for breath test operators on additional breath test instruments.

The Committee also took a position that innovative enforcement activities are needed and should include one or more of the following items:

- "Require license suspension or revocation for all convictions.
- Eliminate jail sentences for first offenders in cases.
- Adopt Procedures of swift adjudication.
- Alcohol treatment should be in addition to, not as a substitute for, license action."

In **1984** the Committee recommended a course of instruction for "Training and Certification of Breath Test Operators on Additional Breath Test Instruments of the Automated Type". (Operator Non-Intensive)

1985 included the following activities:

- A recommendation on the *Electromagnetic Interference Testing of Breath Alcohol Analyzers*.
- A position statement on *Sanctions for Drivers Convicted of Alcohol Impaired Driving*.
- A policy statement on *Enforcement of Laws Aimed at Alcohol Impaired Drivers*
- A position statement on the Uniform Legal Minimum Drinking Age:

"The National Safety Council strongly supports the adoption of uniform legal minimum age of 21 for purchase, possession and consumption of all alcoholic beverages."

1986 marked the 50th year that the Committee on Alcohol and Other Drugs has been in service to traffic safety. An action of the Committee was to recommend a course of instruction for anyone that is a technical supervisor or administrator of a breath testing program.

In **1987** the Committee completed the revision of the 1961 "Alcoholic Influence Report Form" and incorporated standardized field sobriety tests in the performance test section.

Legislation to enable the use of Ignition Interlock Devices (IIDs) as a judicial sanction for repeat offenders had appeared in several states. The Committee responded by taking the following position:

"The Committee believes that the ignition interlock concept merits exploration in a scientifically valid manner;

However, it strongly opposes the use of ignition interlock devices as an alternative to driving license sanctions; and

The Committee further urges the development, by an independent group, of appropriate standards and criteria for the testing and certification of such devices that are developed."

One of the highlights of the Committee for **1988** was the induction of Robert F. Borkestein, a member of the Committee since 1939, and the late James P. Economos, a former chairman of the Committee, into the Safety and Health Hall of Fame International. Other activities of the Committee included a National Safety Council policy statement:

“Impairment at Low Alcohol Concentrations

(Alcohol concentration means either g/100 ml blood or g/210 L breath.)

Laboratory and epidemiological research indicates that the ability of many individuals is impaired for driving and driving-related tasks at alcohol concentrations below 0.08, and that for some individuals impairment does occur at alcohol concentrations below 0.05. Therefore, at alcohol concentrations below 0.05 no statutory presumption regarding the presence or absence of alcohol influence should be made.”

In **1989**, the National Safety Council hosted T89 "The 11th International Conference on Alcohol, Drugs and Traffic Safety", in Chicago and the Committee was again in session at the conference.

The Subcommittee on Technology completed the "Recommendations for Preparation of Alcohol Reference Solutions for Control Tests of Breath Alcohol Testing Instruments by Means of Alcoholic Breath Simulators".

An ad hoc committee completed the revision of the 1967 "A Model Program for the Control of Alcohol for Traffic".

A resolution on the use of 0.08 alcohol concentration in drinking driving statutes that was in conformity with the Committee's 1971 statement was approved. The Committee also approved a policy statement on drug testing in the workplace.

The Robert F. Borkestein Award was created and presented to Robert F. Borkestein for his more than fifty (50) years of contributions to alcohol countermeasures and traffic safety.

In **1990**, the Committee hosted a session during the 1990 National Safety Congress entitled, "Drugs In The Workplace: Occupational Hazard? Lessons From Transportation Safety." In addition, the National Safety Council approved the Committee's policy statement concerning DWI at an alcohol concentration of 0.08. Finally, a report was issued by an ad hoc committee concerning relevant issues of alcohol impairment in crew members in commercial aviation.

In **1991**, the proposed changes in the current Operating Rules of the Committee were approved by the Committee members. The subcommittee on Human Factors subcommittee was dissolved and subcommittees on Pharmacological and Toxicological Factors and Social and Behavioral Factors were formed.

The subcommittee on Pharmacological and Toxicological Factors co-sponsored a workshop with the American Academy of Forensic Sciences' Drugs and Driving Committee at the 1991 Annual American Academy of Forensic Sciences Meeting. The workshop was entitled "The Effect of Drugs on Human Performance and Behavior: Drugs and Driving/Drugs in the Workplace". The meeting was a tremendous success with over 250 attendees.

During **1992**, in response to the Omnibus Transportation Employee Testing Act of 1991 requiring the Department of Transportation to implement alcohol testing in the workplace, the Committee began to draft "(A) Model Program for the Control of Alcohol in the Workplace". In addition, the Membership Subcommittee conducted a comprehensive survey of all members in order to update the membership roster and assess the current interests of each member. The Committee now has 105 members including toxicologists, forensic scientists, attorneys, physicians, behavioral scientists and others. Finally, the Committee sponsored a session titled "Alcohol Testing in the Workplace - Impact of the Omnibus Transportation Employee Testing Act of 1991" at the 1992 National Safety Congress.

In **1993**, the Committee continued its work on the "(A) Model Program for the Control of Alcohol in the Workplace". Additional activities of the Committee included: (1) the preparation of a new edition of the Committee Handbook which includes copies of the Committee's Statement of Purpose, Operating Rules, History, Recommendations, Policy Statements and Resolutions; and (2) the establishment of a liaison with IACT, the International Association for Chemical Testing. Lastly, the Committee sponsored a session titled "Alcohol Testing in the Workplace: Programs and Testing Procedures for Industry" at the 1993 National Safety Congress.

The Committee's activities during **1994** continued to focus strongly on issues relating to the Omnibus Transportation Employee Testing Act of 1991 which appeared in final form in the Federal Register on February 15, 1994. Since these rules coincided directly with the Committee's activities and interests, the following activities were pursued: completion of "(A) Model Program for the Control of Alcohol in the Workplace", and development of guidelines for training of individuals, trainers, and agencies conducting breath alcohol testing in the workplace. In addition, the Committee prepared a policy statement recognizing the Drug Evaluation and Classification Program (DEC) as a useful tool in reducing drug impaired driving in the United States.

During **1995** the Subcommittee on Drugs: Technology, Pharmacology and Toxicology provided two monographs (on cocaine and marijuana) and an extensive bibliography to the Committee. These documents were prepared through a joint effort of the Drugs and Driving Committees of the Society of Forensic Toxicologists and the Toxicology Section of the American Academy of Forensic Sciences.

The Committee's policy statement on the Drug Evaluation and Classification Program was modified and sent back to the division for approval. A position statement on Breath Alcohol Ignition Interlock Devices was also drafted by the Committee. This draft was moved and accepted by the Committee. The issue of breath alcohol specificity is one that the Committee is still considering.

The Committee's Operating Rules underwent revision and the Statement of Purpose was incorporated into the Operating Rules and approved by the Committee at the February **1996** meeting. A Committee Historian was appointed by the incoming Chair for the purpose of updating the Committee Handbook.

October of **1996** marked the 60th anniversary of the committee with 115 members from North

America and Europe. The Action and Legal factors sub-committees provided input into the revision of the Uniform Vehicle Code. A five-year plan was developed to focus the committee's future efforts and expertise.

In **1997** Tim Kennedy began as the new NSC Staff representative following the retirement of Al Lauersdorf after 17+ years.

In **1998**, the Committee began refocusing on its original purpose and several subcommittees began collecting information that would enable the Committee to be a greater resource for lawmakers and technical individuals around the country.

Work began on the draft of a proposed policy statement concerning Zero Tolerance and education in **1999**.

An international consultative meeting was held in **2000** sponsored by the Committee, NHTSA and Washington State on the topic of drugs and driving. Twenty-two delegates from around the world were invited to participate with the objective of bring together experts in psychopharmacology, on-road and simulator driving studies, forensic toxicology and drug recognition experts to discuss empirical evidence for the impairing effects of drugs on driving. A follow-up meeting was held later in the year to work on a report from the evidence reviewed.

That same year the Executive Board approved a resolution commending Kurt M. Dubowski for his faithful to the Committee on the occasion of the 50th anniversary of his membership.

An update to the membership roles was completed and a list server was created in **2002**. Work began on a committee web page also in order to improve participation in Committee activities. The Committee began a partnership with the joint committee of the Society of Forensic Toxicologists and American Academy of Forensic Sciences involved in drug-impaired driving issues. Robert Borkestein passed away in August. Harold Thompson replaced Tim Kennedy as the NSC staff representative.

In **2003** the Committee submitted for addition to a Council Policy its long-standing position (since 1972) on driving impairment at alcohol concentrations of 0.08 and above. It was adopted the following year. A memorial dinner was held for Robert F. Borkestein honoring his lifetime achievements in the field of Highway Safety. NHTSA contracted with the Committee to host a "National Meeting of Toxicologists to Improve and Harmonize Expert Testimony on the Effects of Drugs on Driving." A review of the operating rules was begun in order to allow flexibility in scheduling meetings including changing the annual meeting to February. This also allowed the Committee Executive Board to meet in October in conjunction with the Society of Forensic Toxicologists.

The first annual meeting to be held under the newly revised schedule was in February of **2004**.

RECOMMENDATIONS

Of the NATIONAL SAFETY COUNCIL'S COMMITTEE ON ALCOHOL AND OTHER DRUGS

Appendix A

A MODEL PROGRAM FOR THE CONTROL OF ALCOHOL FOR TRAFFIC SAFETY

1967

developed for the

**National Highway Safety Bureau
United States Department of Transportation**

**NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS**

(FOR HISTORICAL PURPOSES ONLY. SINCE REPLACED WITH UPDATED VERSION
LOCATED IN APPENDIX B)

A MODEL PROGRAM FOR THE CONTROL OF ALCOHOL FOR TRAFFIC SAFETY

Each state must have a program designed to minimize the contribution of alcohol as a causative factor in traffic accidents. The program shall include educational and legal elements and a means for continued program evaluation. It shall be a balanced program emphasizing both preventive and punitive features of control of alcohol for traffic safety. All elements of the program shall maintain effective liaison in respect to their activities and policies.

I. PUBLIC INFORMATION AND EDUCATION

A. Public Information

Each state shall develop and activate a plan for effective communication with relevant segments of the public in respect to:

- i. The nature and extent of alcohol involvement in traffic accidents.
2. Means to prevent and to control this involvement.

Pertinent information shall be directed towards selected target groups in addition to the public at large. These include the categories of users of alcohol, abstainers, the medical and legal professions, law enforcement agencies, various driver organizations, and educational institutions. The goal of this activity will be the accomplishment of an attitude of change toward drinking and driving.

B. Education

Each state shall provide, through its system education, teaching materials relevant to alcohol and traffic safety to educational institutions, especially secondary schools. It will also conduct through appropriate educational channels training conferences for vocational and professional groups with direct program responsibility such as driver training instructors, and the police, prosecutors, and judges. Educational programs in the attack upon traffic-alcohol death, and injury should be developed with liaison and in cooperation with groups in national, state and local government, and also with any other groups which are responsible for and experienced and concerned with (a) education, (b) other alcohol problems, and (c) other traffic problems.

A. Legislative

Each state should enact legislation that includes the following items:

1. That it is an offense to drive or operate or to be in actual physical control of any vehicle while under the influence of alcohol.

2. A chemical test law establishing admissibility of chemical test evidence in criminal and civil cases and establishing presumptive levels in respect to alcohol influence.
3. An implied consent law by which a driver on the highway is deemed to have given his consent to a chemical test, or alternatively, legislation making chemical tests compulsory for persons involved in accidents while driving or operating a vehicle. (See section on Law Enforcement.)
4. Provision for central state control of chemical test methods and certification of qualified persons to conduct chemical tests.
5. Authorization of law enforcement officers to apprehend drivers under the influence of alcohol without warrant in the same manner as in felony cases—upon probable cause.
6. Regulation of post mortem investigations with at least the following features:
 - (a) Compulsory requirement for coroners to perform post mortem investigations of all vehicular-related deaths occurring within six hours as a result of accident or other happening.
 - (b) That no person (funeral director, embalmer, etc.) having custody of the body of such a deceased person shall perform any internal embalming procedure until authorized to do so by the physician who has performed or shall perform the post mortem examination.
7. Mandatory revocation of the operator's license upon conviction for driving while under the influence of alcohol.
8. Authorization of discretionary administrative action in suspending the operator's license when there is sufficient evidence that the licensee has committed an offense for which mandatory revocation of license is required upon conviction.
9. Establishment of immunity from lawsuits for physicians and ether qualified persons withdrawing blood specimens from arrested motorists at the request of law enforcement officers.
10. The requirement that analysis for alcohol of the specimens obtained in such deaths shall be conducted by a procedure that is considered specific for ethyl alcohol and that will distinguish among ethyl alcohol, isopropyl alcohol, methyl alcohol, formaldehyde and acetone.

Specifications and Discussion

The Uniform vehicle Code (Revised--1962) should be used as a guide in formulating legislation in respect to most of the various items: Item 1, Section 11-902(a); Item 2, Section 11-902(b); Item 3, Sections 1-155, 6-205.1, 6-208, 6-211, 11-902; Item 4, Section 11-902(c); Item 5, Section 16-105(a); Item 7, 6-205; Item 8, 6-206.

A procedure specific for alcohol should be used in death investigations for the sake of specificity itself, and to avoid measuring the varying and possibly quite large quantities of non alcohol volatile reducing substances in specimens exhibiting putrefaction. In addition, an appropriate procedure shall be one which detects the components of embalming fluids when present.

B. Law Enforcement

All police agencies must adopt and maintain programs for prevention, detection, apprehension, and the processing of motor vehicle offenses by those persons whose driving ability is impaired by alcohol as defined by existing statute. Preventive procedures shall include cooperation and participation in educational matters (see section on Public Information), and careful administrative assignment and allocation of manpower for deterrent purposes, including surveillance of drivers whose licenses have been suspended. In addition spot check tests, or tests with blockades should be encouraged as deterrents. Continued efforts to strengthen the relationship between police agencies, prosecutors, courts, and the public are to be encouraged.

Measures for detection, apprehension, and processing of suspects shall include an appropriate amount of instruction of officers regarding:

1. The various manifestations of alcoholic impairment, especially in connection with motor vehicle operation.
2. Proper acquisition and recording of the information requested in the Standard Accident Report Form.
3. Employment of chemical test devices.
4. The proper execution of the Alcoholic Influence Report Form including the performance and evaluation of appropriate behavioral tests.
5. The possible recognition and procedures for investigation of individuals under the influence of drugs other than alcohol, and referral to appropriate agencies of individuals with natural illness and injuries.

C. Chemical Tests

In each state an appropriate designated agency shall:

1. Promulgate regulations concerning the collection, preservation, and storage of blood, breath, and other body substances and for analysis of these for alcohol content. Analyses shall be performed only on specimens of blood, breath, or urine in the case of living subjects. Blood and breath are to be preferred. Choice of specimens from subjects of autopsies is at the discretion of the physician. Specimens of blood from sites not likely to be affected by admixture or diffusion of alcohol from the gastrointestinal tract contents are to be preferred.
2. Develop a suitable program for periodic monitoring of performance ("quality control") of laboratories performing blood or urine alcohol analyses and agencies or laboratories involved in the use of breath alcohol devices.
3. Provide information and advice relevant to chemical testing to law enforcement agencies and other interested parties.
4. Provide for appropriate training in the performance of alcohol analyses with certification of individuals meeting the performance requirements established.
5. Prepare for the development of adequate means for testing for drugs other than alcohol in specimens of body materials from subjects suspected of being impaired by such drugs or by other exogenous chemical agents.

The methods of analysis must meet the reliability criteria including those of accuracy, precision, and specificity acceptable to the National Highway Safety Bureau. Blood concentrations giving rise to presumptions regarding alcoholic influence shall be those obtained by analysis of specimens taken as quickly as feasible after the time of the suspected offense. When a speculative retrograde extrapolation of a blood alcohol concentration to any prior time is made, this is to be in response to a carefully designed hypothetical question, or is to be accompanied by an explanation of the presumptions necessary in making the extrapolation. It is urged that blood analyses be limited to specimens of capillary blood, that is, blood approximating arterial composition, in respect to alcohol, as soon as the requisite procedural capabilities have been attained. As blood plasma or serum are the preferred blood components for analysis, they should be designated as the preferred fluids to be analyzed in any subsequent revisions of chemical test legislation.

Breath alcohol analyses shall be performed only with apparatus, equipment, and by techniques meeting the reliability criteria including those of accuracy, precision, and specificity acceptable to the National Highway Safety Bureau. The breath methods employed in obtaining evidence for use in court shall be those utilizing breath specimens which were substantially in equilibrium with respect to alcohol with pulmonary arterial blood plasma.

The limitations in extrapolation of derived blood alcohol concentrations giving rise to presumptions regarding alcoholic influence shall be those obtaining for the direct analysis of blood. (See preceding section on blood.)

Qualifications of personnel involved in the various aspects of chemical testing shall be at least those acceptable to the National Highway Safety Bureau. Screening, or on-the-spot tests for the approximate alcohol content of breath specimens for field use by law enforcement agencies for certain limited purposes (e.g., spot checks for the purpose of detecting the incidence of impaired drivers) should employ measured specimens of breath substantially alveolar with respect to alcohol.

The results of such screening or on-the-spot tests shall not be used in any subsequent prosecution for driving or being in actual physical control of a motor vehicle while under the influence of intoxicating liquor.

Specifications and Discussion

Blood and breath are preferred over a single random urine specimen for analysis for alcohol because ordinarily it is not possible to properly conclude that the concentration of alcohol in the water of the blood at the time of delivery of the urine specimen closely approaches that found in the urine itself.

Upon completion of absorption and distribution, the blood alcohol concentration decreases with time consequent to various elimination processes (oxidation, urine formation, pulmonary vaporization, etc.) by a rate which averages about 0.018% W/V per hour, but this may vary from person to person by at least $\pm 50\%$ of this figure. Blood alcohol concentration may increase with time during absorption of alcohol from the gastrointestinal canal. In any given case the relevant information is rarely available that permits the presumption that the blood alcohol had declined with the passage of time from the arrest to the taking of the specimen. Therefore, an unbiased estimate of blood alcohol concentration at a prior time can only be made by presuming certain "facts." This should always be made clear to law enforcement officers, judges, and juries. It follows that the shorter the interval between the time of arrest and specimen collection the better. It is believed this interval need not exceed one hour in the case of most arrests. To define statutorily the offense as that of having a blood alcohol concentration in excess of a given figure at the time of taking of the specimen appears to be the preferred means of eliminating this vexing aspect of chemical testing.

The use of capillary blood for alcohol analysis is preferred because this blood has a composition approaching that of arterial blood in respect to alcohol and if the plasma or serum of such blood is analyzed, the result obtained is directly comparable to the result obtained by calculation from a simultaneous breath analysis.

In the analysis of blood specimens at least duplicate determinations should be performed on each specimen. If the results agree within $\pm 10\%$ of the mean, the mean should be reported as the result. If the agreement is not within these limits, each result obtained should be reported. Blood alcohol results should be expressed in terms of % W/V, i.e., grams of alcohol per 100 milliliters of blood to the second decimal place. The test result reported in the case of breath analysis should be the mean of the results of the analysis of at least two separately collected breath specimens providing the results agree within $\pm 10\%$ of the mean value. If the results do not agree within these limits, all results obtained should be reported. Breath

alcohol analyses should be expressed in terms of the corresponding blood alcohol concentrations as directed in the case of direct analysis of the blood. As revisions in chemical test legislation are enacted it is recommended that the alcohol concentration in liquid specimens be expressed as mgs of alcohol per 100 ml of fluid with the third figure being zero in each case (e.g., 166 mgs per 100 ml found would be reported as 160 mgs per 100 ml of, etc.).

It is hoped that in the future breath quantities of alcohol may be defined in terms of milligrams of alcohol per unit volume of breath which is substantially alveolar in composition with respect to alcohol, thus avoiding the necessity of making any indirect calculation to a presumed blood alcohol concentration equivalent.

One or more laboratories in each state should prepare for the development of means for testing for drugs other than alcohol in subjects suspected of being, impaired by the effects of such drugs or other exogenous chemical agents. It is recommended that the National Highway Safety Bureau accumulate information on such matters as: (1) the effects of individual drug substances on human performance relevant to driving, and (2) choice and quantities of specimens for individual drug determinations, individual procedures for such determinations, and screening procedures for drug substances, especially the narcotic analgesics, sedatives, antihistamines, tranquilizers, psychodelics, other psychopharmacologic agents, and other central nervous system affectants that might be encountered in drivers. It is urged that the National Highway Safety Bureau arrange for the communication of the information (or listings of its sources) to an appropriate state official who in turn should transmit this to the various individual laboratories for immediate implementation to the degree each state deems fit. It is also recommended that existing information on the incidence and significance of drugs other than alcohol in drivers be accumulated and that further investigation of the incidence and significance be encouraged. When and if, in the view of the National Highway Safety Bureau, sufficient justifying information has been accumulated, the Bureau should establish minimum criteria for testing for such drugs analogous to criteria for testing for alcohol.

Personnel qualifications for the education, training and experience of all individuals concerned with the technical aspects of chemical testing shall be at least those acceptable to the National Highway Safety Bureau. The details of individual program supervision by the state agency ought at least to meet the minimum requirements of the National Highway Safety Bureau.

D. Behavioral Tests

Behavioral tests and observation for possible impairment should be made on every driver involved in accidents investigated by the police, and on every driver who is arrested on suspicion of driving while under the influence of alcohol. The Alcoholic Influence Report Form developed by the National Safety Council Committee on Alcohol and Drugs should be the minimum guide used in examining, interpreting, and recording the results of such tests and the form should be expanded to contain instructions to better standardize its use. The

use of photographs, motion pictures, video tapes, and sound recordings to document behavior should be encouraged.

E. Prosecution

Each state shall conduct regular periodic court conferences within the state, making it mandatory for all judges and prosecutors in those courts having jurisdiction of offenses involving driving while under the influence of alcohol to attend. In such conferences all problems concerning prosecution and rehabilitation of the drinking driver and their solutions may be considered. These conferences should be integrated, when feasible, with the other elements of the educational program. To eliminate the unwarranted reduction of charges against motorists arrested for driving or being in actual physical control of a vehicle while under the influence of alcohol the administrative suspension of the operator's license described in the legislative section (see above) is recommended.

III. PROGRAM EVALUATION

Each state shall devise a system of periodic program evaluation adequate to determine the effectiveness of each element of the program. Such a system must include arrangements for external as well as internal inspection; for example by the National Highway Safety Bureau. Results of the program evaluation are to be made available to the governor of the state and the National Highway Safety Bureau at one-year intervals. This report may be made a part of a more comprehensive report dealing with other aspects of the total Highway Safety Program.

Appendix B

A MODEL PROGRAM FOR THE CONTROL OF ALCOHOL FOR TRAFFIC SAFETY

1989 Revision

NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS

A MODEL PROGRAM FOR THE CONTROL OF ALCOHOL FOR TRAFFIC SAFETY

1989 Revision

NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS

Each state must have a program designed to minimize the contribution of alcohol as a factor in traffic accidents. The program shall include educational and legal elements and a means for continued program evaluation. It shall be a balanced program emphasizing both preventive and punitive features of control of alcohol for traffic safety. All elements of the program shall maintain effective liaison in respect to their activities and policies.

PUBLIC INFORMATION AND EDUCATION

A. Public Information

Each state shall develop and activate a plan for effective communication with relevant segments of the public in respect to:

1. The nature and extent of alcohol involvement in traffic accidents.
2. Means to prevent and to control this involvement.

Pertinent information shall be directed towards selected target groups in addition to the public at large. These include the categories of users of alcohol, abstainers, the medical and legal professions, law enforcement agencies, various driver organizations, and educational institutions. The goal of this activity will be the accomplishment of an attitude change toward drinking and driving.

B. Education

Each state shall provide, through its system of education, teaching materials relevant to alcohol and traffic safety to educational institutions, especially elementary and secondary schools. It will also conduct through appropriate educational channels training conferences for vocational and professional groups with direct program responsibility such as drivers training instructors, and law enforcement officers, prosecutors, and judges. Educational programs should be developed with liaison and in cooperation with groups in national, state and local government, and also with any other groups in national, state and local government, and also with any other groups which are responsible for and experienced and concerned with education, other alcohol problems, and other traffic problems.

H. LEGAL

A. Legislative - Each state should enact legislation which includes the following items:

1.
 - a. That it is an offense to drive or operate or to be in actual physical control of any vehicle while under the influence of alcohol.
 - a. That it is an offense to drive or operate or be in actual physical control of any vehicle with an alcohol concentration not greater than "0.08 or more". (Illegal per se)
2. A chemical test law establishing admissibility of such evidence in criminal and civil cases and establishing a presumptive alcohol concentration not greater than "0.08 or more".
3. An implied consent law by which a driver on the highway is deemed to have given his consent to a chemical test or tests.
4. A companion law to implied consent which revokes the driver's license of any driver who submits to a chemical test for intoxication under the implied consent law and has an alcohol concentration not greater than "0.08 or more". (Administrative per se)
5. That alcohol concentration shall mean either grams of alcohol per 100 milliliters of blood or grams of alcohol per 210 liters of breath.
6. Provision for central state control of chemical test methods and certification of qualified persons to conduct chemical tests.
7. Establishment of immunity from lawsuits for physicians, other qualified persons, and medical facilities withdrawing blood specimens from arrested motorists at the request of law enforcement officers.
8. Authorization of law enforcement officers to apprehend drivers under the influence of alcohol without warrant in the same manner as in felony cases-upon probable cause.
9. Regulation of fatality investigations with at least the following features:
 - a. Compulsory requirement for coroners and medical examiners to perform investigations and collect specimens from all vehicular related deaths occurring within six hours after the event.
 - b. That no person having custody of the body of such a deceased person shall perform any internal embalming procedure until authorized to do so by the coroner or medical examiner.
 - c. The requirement that analysis for alcohol of the specimens obtained in such deaths shall be conducted by a procedure which is considered specific for ethyl alcohol and which will distinguish among ethyl alcohol, isopropyl alcohol, methyl alcohol,

formaldehyde, and acetone.

10. Mandatory revocation of the operator's license upon conviction for driving while under the influence of alcohol or other alcohol related offenses.

Note: The Uniform Vehicle Code (Revised - 1987) should be used as a guide in formulating legislation in respect to most of the legislative items: Item 1, Section 11-902(a)(1) and(a)(2); Item 2, Section 11-903; Item 3, Section 6-207et. seq.; Item 4, Section 6-207 et. seq.; Item 5, Section 11-903 (a)(5); Item 6, Section 11-903 (a)(1); Item 8, Section 16-202; Item 9, Section 10-116; Item 10, Section 6-206.

B. Law Enforcement

All law enforcement agencies must adopt and maintain programs for the prevention, detection, apprehension, and processing of motor vehicle offenses by persons whose driving ability is impaired by alcohol as defined by existing statute.

Preventive procedures shall include cooperation and participation in educational matters and careful administrative assignment and allocation of personnel for deterrent purposes, including surveillance of drivers whose licenses have been suspended or revoked. In addition, sobriety checkpoints should be encouraged as deterrents.

Efforts to strengthen the relationship between law enforcement agencies, prosecutors, courts, and the public are essential.

Measures for the detection, apprehension, and processing of suspects shall include an appropriate amount of instruction of officers regarding:

1. Various manifestations of alcohol impairment, especially in connection with motor vehicle operation.
2. Proper acquisition and recording of the information requested in the official accident report form.
3. Proper completion of an Alcoholic Influence Report Form including the evaluation of appropriate performance tests.
4. Employment of chemical tests for intoxication.
5. Recognition and procedures for investigation of individuals under the influence of drugs other than alcohol, and referral to appropriate agencies of individuals with natural illness and injuries.

C. Chemical Tests

Agency Requirements

In each state an officially designated agency shall:

1. Promulgate regulations concerning the collection, preservation, and storage of blood, breath, or other body substances and analysis of these for alcohol content.
 - a. In living subject, breath and blood specimens are preferred.
 - b. In fatalities, specimens of blood from sites not likely to be affected by admixture or diffusion of alcohol from the gastrointestinal tract contents are to be preferred.
2. Develop an effective program for regular monitoring of performance and quality assurance of law enforcement agencies and laboratories performing alcohol analysis.
3. Provide information and consultation concerning chemical testing to law enforcement agencies and other interested parties.
4. Provide for appropriate training in the performance of alcohol analyses and certification of individuals meeting the performance requirements established.
5. Develop adequate means for testing for drugs other than alcohol in specimens of body materials from subjects suspected of being impaired by such drugs or by other chemicals.

Breath

The sample used for evidentiary breath testing shall be end expiratory breath. Breath alcohol analysis shall be performed with instruments and by techniques which at least meet criteria including those of accuracy, precision, reliability, and specificity as provided by the United States Department of Transportation (52FR6727).

Evidentiary breath test operators shall have successfully completed a course of instruction at least comparable to that developed by the National Safety Council's Committee on Alcohol and Other Drugs.

Breath testing instruments for roadside use by law enforcement agencies for certain limited purposes should employ end expiratory breath.

Blood

Blood specimens must be taken as quickly as feasible after the time of the event. The methods of analysis must meet criteria including those of accuracy, precision, reliability, and specificity acceptable to the United States Department of Transportation.

Other Analyses

One or more laboratories in each state should be certified for testing for drugs other than alcohol in subjects suspected of being impaired by such drugs or other chemical agents.

Qualifications and Training

Personnel qualifications for the education, training and experience of all individuals involved with the technical aspects of chemical testing shall be at least comparable to those developed by the National Safety Council's Committee on Alcohol and Other Drugs. The details of individual program supervision by the state agency should at least meet the standard formulated by the Committee on Alcohol and Other Drugs.

D. Behavioral Tests

Behavioral tests and observations for possible impairment should be made on every driver involved in accidents investigated by law enforcement officers, and on every driver who is arrested on suspicion of driving while under the influence of alcohol. The Alcoholic Influence Report Form developed by the National Safety Council's Committee on Alcohol and Other Drugs should be the minimum guide used in examining, interpreting, and recording the results of such tests and the form should be expanded to contain instructions to better standardize its use.

The use of photographs, motion pictures, video tapes, and sound recordings to document behavior should be considered.

E. Prosecution

Each state shall conduct periodic court conferences, making attendance mandatory for all judges and prosecutors in courts having jurisdiction of offenses involving driving while under the influence of alcohol. In such conferences all problems concerning prosecution and sanctioning of the drinking driver and their solutions, new legislation, information, court decisions, and trends may be considered.

Plea bargaining with motorists arrested for driving under the influence should be eliminated.

III. PROGRAM ADMINISTRATION

Communication and cooperative working relationships among agencies involved in alcohol/traffic safety programs are essential for optimal functioning of a model program.

A. Chemical Testing

1. An officially designated central laboratory for blood and breath analysis, laboratory and operator certification, and breath testing instrument, simulator, and solution certification is recommended. This laboratory shall have the responsibilities described in Section II C.

2. The scientific director should have an advanced degree in chemical or biological sciences and extensive training and experience in blood and breath testing and program management. The scientific director shall be responsible for Section II C 1-5, regulations on specimen collection, storage and analysis, quality assurance, performance evaluation, and certification of breath and blood alcohol and other drug testing agencies.
3. The technical director shall be responsible for operator training, instrument maintenance and certification, and ongoing program management of the breath testing program.
4. The scientific and technical directors are responsible for continuing liaison activities with law enforcement officers, prosecutors, the courts, and state public information and education and program evaluators.

B. Enforcement and Adjudication

1. It is desirable for a single state agency to provide continuing education and program evaluation to state and local law enforcement agencies with respect to driving under the influence of alcohol and other drugs, and to conduct liaison activities between them and the chemical testing, public information and education, and program evaluators.
2. Prosecution: Because prosecutors operate independently, for the most part, they should be strongly encouraged to participate in educational programs such as those offered by state and national district attorney's associations, the American Bar Association, the state court administrator's office, office for highway safety and other educational institutions offering relevant programs.
3. Adjudication: The state court administrator's office should provide regular programs of judicial education, and may coordinate educational efforts for prosecutors.

C. Public Information and Education

An agency, such as the office of the governor's highway safety representative or a state or local safety council, should be designated as coordinator for all alcohol and driving information, related literature, educational materials, and data and audiovisual aids intended for media use.

Other state agencies and local entities should be strongly encouraged to use the materials disseminated by the coordinating agency or to seek approval of materials they use to ensure uniformity in the alcohol and driving message.

D. Program Evaluation

A single agency should be responsible for the evaluation of the success of the overall

program and the integration of all the elements with respect to the goal of reduction of driving under the influence of alcohol and other drugs, and the consequent damage.

IV. PROGRAM EVALUATION

Each state shall devise and implement an evaluation system adequate to determine the effectiveness of the program. Such a system must include arrangements for external as well as internal inspection. Results of program evaluation are to be made available to the governor of the state and the National Highway Traffic Safety Administration at intervals. This report may be made part of a more comprehensive report dealing with other aspects of the total Highway Safety Program.

Appendix C

A MODEL PROGRAM FOR THE CONTROL OF ALCOHOL WORKPLACE TESTING

1994

NATIONAL SAFETY COUNCIL COMMITTEE ON ALCOHOL AND OTHER DRUGS

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Summary Sheet

Model Program

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A	Program Considerations - Legal	Appendix K
B	Recommendations on Testing and Training	Attachment 1
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D	Additional Considerations and Recommendations Breath Alcohol Technician Certification and Recertification	Attachment 2

NOTE: The Model Program as approved by the Committee, referenced several attached appendices. Appendix A, Program Considerations -- Legal, has been omitted hereto, as the legal considerations for workplace testing have changed since 1994. Copies of the legal considerations, as originally published, may be obtained from the Committee. Appendix C, Alcohol Reference Solution Preparation, has also been omitted as it is already a part of the Committee Handbook (See Appendix K).

The following recommendations are those of the National Safety Council's Committee on Alcohol and Other Drugs and are provided as a reference when establishing a program in response to the Omnibus Transportation Employee Testing Act of 1991.

FOREWORD

The intent of the Act is to prevent alcohol misuse by transportation workers. Each affected DOT entity - FAA, FHWA, FRA, FTA, and RSPA - must establish drug and alcohol testing programs to enhance the overall public safety.

BACKGROUND

The Act prohibits covered employees from performing safety-sensitive functions: (1) When test results indicate a breath alcohol concentration of 0.04 or greater; (2) Within four hours after using alcohol (eight hours for flight crewmembers); (3) While using alcohol on the job; (4) During eight hours following an accident if their involvement has not been discounted as a contributing factor in the accident or until they are tested for alcohol; (5) While behavior and appearance are characteristic of alcohol misuse or their ability to perform safety-sensitive functions is adversely affected by alcohol use; and (6) If they refuse to submit to required alcohol tests.

PURPOSE

The purpose of the Act is to ensure that each affected DOT agency has an alcohol testing program designed to help prevent accidents and injuries resulting from the misuse of alcohol by employees who perform safety-sensitive functions in the industry under its purview. Employers would have to remove from a safety-sensitive function any covered employee who violates any of the six prohibitions until he or she has met the conditions for returning to a safety-sensitive function. These conditions may vary slightly between agencies but generally are that the employee must test less than 0.02 alcohol concentration, be evaluated and rehabilitated if necessary, be seen by a substance abuse professional (SAP), and that the employer determines that the employee is fit for duty.

SUMMARY

The testing program should be designed to minimize alcohol as a contributing factor in accidents, injuries, and on the job fatalities. The program shall include educational and legal elements, a means for continued program evaluation, and a testing component. It shall be a balanced program emphasizing both preventive and punitive features for the control of alcohol in the workplace. All elements of the program shall maintain effective liaison in respect to their activities and policies.

A MODEL PROGRAM FOR THE CONTROL OF ALCOHOL IN THE WORKPLACE

Each affected Department of Transportation agency must have a program designed to help prevent accidents and injuries resulting from the misuse of alcohol by employees who perform safety-sensitive functions in the industry under its purview. The program shall include educational and legal elements and a means for continued program evaluation. It shall be a balanced program emphasizing both preventive and punitive features of control of alcohol for the workplace. All elements of the program shall maintain effective liaison in respect to their activities and policies.

PUBLIC INFORMATION AND EDUCATION

A. Public Information

The goal of this activity will be the accomplishment of an attitude change towards alcohol use in the workplace. Each entity affected by the regulations shall develop and activate a plan for effective communication with relevant segments of the affected workers and the public in respect to:

1. The nature and extent of alcohol involvement in the-workplace. This shall include industry specific information related to the potential effects of alcohol misuse which are substantial in terms of lives lost, injuries, and environment and property damage.
2. Means to prevent and to control such involvement.

Pertinent information shall be directed towards selected target groups in addition to the public at large. Examples of target groups are users of alcohol, abstainers, the medical and legal professions, law enforcement agencies, unions, employee organizations, and educational institutions.

B. Education

Educational programs should be developed through liaisons and in cooperation with groups in national, state and local government, as well as any other groups which are responsible for, experienced in, or concerned with education or other alcohol problems within the workplace.

C. Requirement of Notice

This shall include all notices required by the Omnibus Transportation Employee Testing Act of 1991.

D. Notification of Other Requirements Imposed by Employers

This shall include notification of all involved groups of the additional testing, penalties, and return to duty requirements imposed by the employer in addition to those imposed by the Omnibus Transportation Employee Testing Act of 1991.

II. PROGRAM CONSIDERATIONS - LEGAL

Each entity affected by these regulations should become familiar with the Omnibus Transportation Employee Testing Act of 1991 and its' requirements and terminology including the following:

1. DOCUMENTATION OF THE ACT ITSELF
2. APPLICABILITY
3. ALCOHOL TESTING PROCEDURES
4. DEFINITIONS
5. EFFECTS OF ALCOHOL
6. PROHIBITIONS
7. STATE AND LOCAL LAWS
8. TESTING REQUIRED
9. RESULTS HANDLING
10. CONSEQUENCES FOR EMPLOYEES VIOLATING ACT
11. ALCOHOL MISUSE INFORMATION, TRAINING AND REFERRAL
12. TRAINING
13. ALCOHOL TEST SITES
14. MISCELLANEOUS

III. PROGRAM ADMINISTRATION AND PERSONNEL

Communication and cooperative working relationships among affected entities involved in alcohol safety programs are essential for optimal functioning of a model program.

A. Technical Supervisor

The responsibilities of the Technical Supervisor include inspection, maintenance and calibration of breath testing equipment. The Technical Supervisor is also responsible for training and periodic re-evaluation of the Breath Alcohol and Calibration Technicians under his/her jurisdiction to ensure technical knowledge and competence, and the periodic calibration of the devices under his/her control.

NOTE: The Model Program, as approved by the Committee, has an appendix that outlines the program considerations as they existed in 1994. The Federal Regulations have since changed. Refer to 49 CFR Part 40 for the current guidelines.

B. Breath Alcohol Technician (BAT).

A Breath Alcohol Technician is an individual who instructs and assists employees during the alcohol testing process and operates an EBT.

IV. TRAINING OF PROGRAM PERSONNEL

All training recommendations are covered either in Attachment 1 or Attachment 2³. Several additional training considerations and recommendations are covered in more detail in Attachment 2.

3 The attachments referred to herein were identified as Appendix B and Appendix D respectively in the approved program.

ATTACHMENT 1

RECOMMENDATIONS ON TESTING AND TRAINING

For the purposes of enforcement and in connection with programs for the control of alcohol in the workplace, this Ad Hoc Committee concurs unanimously in making the following recommendations in the light of currently available information.

I. Specimens

The biological specimen of choice for the determination of ethyl alcohol under the DOT Omnibus Transportation Employee Testing Act of 1991 is end-expiratory breath. DOT may add other specimens at a later date.

Suitable breath specimens are those in which the ethyl alcohol is substantially in equilibrium with the alcohol of the pulmonary arterial blood plasma. Alveolar or "Deep Lung Air" is such a specimen.

Because of problems associated with obtaining a blood specimen and having it analyzed for its alcohol concentration, blood as a specimen is discouraged in the context of these recommendations.

II. Procedures and Analysis:

A. Procedural Controls

Analytical procedures for breath alcohol analysis should include the following controls in conjunction with the testing of each subject:

- Continuous observation/deprivation of the subject for AT LEAST fifteen (15) minutes prior to collection of the breath specimen. During this period the subject must not have ingested anything including beverages, food, candies, etc.; regurgitated or vomited; smoked. If any of the above do occur, the mouth should be emptied and the period of observation/deprivation started again.
- A blank analysis consisting of analysis of a room air sample. Such an analysis shall produce a result of less than .01 g/210L.
- The sample used for evidentiary breath testing shall be end-expiratory breath. Breath alcohol analyses shall be performed with instruments and by techniques which at least meet criteria including those of accuracy, precision, reliability, and specificity as provided by the United States Department of Transportation (52FR6727).

The quantity of breath analyzed for its alcohol content shall be established only by direct volumetric measurement, or by collection and analysis of a fixed breath volume.

Alcohol concentration shall mean grams of alcohol in 210 liters of expired deep lung air and shall be abbreviated g/210L.

3. Alcohol shall mean ethyl alcohol.

III. STANDARDS OF TRAINING

In order to implement and monitor the application of the above and other application standards, the Ad Hoc Committee unanimously recommends the following minimum standards of training. For the purposes of the section, the activities of a program of chemical testing for alcohol will be classified as follows:

- A. Interpretation
- B. Technical Supervision
- C. Calibration Technician (see attachment 2)
- D. Breath Alcohol Technicians (BAT's)

Although the titles assigned to the individuals associated with these activities may vary in different jurisdictions, their functions generally will be expected to remain the same.

These recommendations are intended to describe the minimum training and educational requirements deemed necessary to ensure efficient and dependable administration of a program of chemical testing for alcohol. They are not intended to provide guidelines for all aspects of a chemical test program.

A. Interpretation

In any chemical testing program there should be readily available professional personnel to provide expert testimony and to interpret the pharmacological and physiological significance of the analytical results.

No specific training recommendations are made regarding professional competence at this level in light of the adequacy of the basic academic and professional education of such individuals.

B. Breath Test Supervisor

Technical supervision of chemical tests for alcohol must be exercised continually. The responsibilities of the Technical Supervisor include inspection, maintenance and calibration of breath testing equipment. The Technical Supervisor can be a BAT who is responsible for training and periodic re-evaluation of the Breath Alcohol Technicians under his/her jurisdiction to ensure technical knowledge and competence.

1. Qualifications

For individuals exercising the preceding functions, the minimum qualifications are:

- a. High School graduation or its equivalent.
- b. Accreditation as an operator of the chemical test method he or she is to supervise, or possession of equivalent knowledge to qualify as such.
- c. Satisfactory completion of a DOT certified BAT course of instruction with a minimum of eight additional hours of course work in alcohol detection and analytical testing.

C. Breath Alcohol Technicians

1. Training

In lieu of formal educational requirements, a pre-course screening test may be used to determine the technical aptitude of prospective technicians. The recommended course of instruction includes the following subject matter:

- a. Instruction on alcohol and the human body.
- b. Instruction on the operational principles of the selected testing method which is to include:
 1. A functional description of the testing method.
 2. A detailed operational description of the method with demonstrations.
 3. A description of how breath alcohol testing works.
- c. Instruction on the legal aspects of the Act including the paperwork and reporting procedures required.
- d. Instruction on supplemental information which is to include nomenclature

appropriate to the field of chemical tests for alcohol and the Act.

- e. Laboratory participation using appropriate equipment. Laboratory practice will include the use of reference alcohol samples, and should include the testing of actual drinking subjects.
- f. A formal examination for purposes of determining the competency and qualifications of the technician or trainee.

2. Breath Alcohol Technician Approval

The minimum requirement for certification as a BAT should be the satisfactory completion of a basic course of instruction as recommended and approved by DOT. The approval should specify the breath testing equipment that the *BAT* is certified to operate.

A minimum of at least eight hours of course work is recommended by the National Safety Council's Committee on Alcohol and Other Drugs under this model program. Refer to Attachment 2 for additional training and testing considerations. The selected course work and number of hours should at least correspond to the final DOT ruling with respect to the Act.

D. Additional Training Considerations

The National Safety Council's Committee on Alcohol and Other Drugs has further information that might be helpful to agencies who are reviewing or updating their alcohol testing programs. The Committee's Handbook can be obtained and reviewed for additional information.

Attachment 2

ADDITIONAL CONSIDERATIONS AND RECOMMENDATIONS ON TRAINING AND PROGRAM MANAGEMENT

ADDITIONAL CONSIDERATIONS

I. Calibration Technician

Additional consideration should be given to having a Calibration Technician for instrument and program management.

The Calibration Technician shall have all of the training provided to the BAT plus additional training necessary to accurately calibrate and insure the proper operation of the breath testing device(s) under his/her control.

Such training shall consist of at least a manufacturer's approved course on instrument calibration and the analytical preparation of simulator solutions.

TESTING

II. Reference or Control Sample

Analysis of a suitable reference or control sample, such as air equilibrated with a reference solution of known alcohol content at a known temperature, the result of such analysis must agree with the reference sample value within the limits of +/- 0.01 grams/210 Liters. This analysis would immediately precede or immediately follow the analysis of the breath of the subject.

III. Additional Testing

When the first sample tested is positive for any amount of ethanol the following procedure is recommended:

At least two separate breath samples should be collected and analyzed individually in performing any quantification of an evidential breath alcohol analysis. The breath samples should be collected at intervals of not less than two nor more than ten minutes, after an initial observation/deprivation period of at least fifteen minutes. Reported breath-alcohol analysis shall be truncated to two decimal places, and all results obtained shall be reported. Consecutive breath alcohol analysis within 0.02 grams/210 Liters, without regard to sign, shall be deemed to be in acceptable agreement.

IV. BAT Certification and Re-Certification

A. Certification

Upon satisfactory completion of a DOT recognized Breath Alcohol Technicians' course, an individual should be eligible to be certified by an appropriate authority to conduct breath alcohol analyses. The certificate should specify the make and model of breath testing equipment that the BAT was trained on, and should qualify him to operate only that equipment.

B. Recertification

It is recommended that initial certification to conduct breath alcohol analyses be valid for a period not to exceed one year from the date of issue and that renewed certification be valid for a period not to exceed two years. In order to maintain a valid certification, it is recommended that the BAT:

- Conduct a minimum of three breath alcohol instrument analyses each working month consisting of either reference samples or actual subjects.
- Demonstrate competence to perform satisfactory breath analyses to the Technical Supervisor at any time required and at intervals not to exceed one year.

Certificates may be revoked, suspended, or canceled for cause by the certifying authority, or may be voluntarily surrendered by the BAT.

C. Renewal of Expired Certification

A BAT whose certification has either expired or lost validity should not be eligible for renewal until satisfactorily completing the procedure for renewal or, failing that, the basic course for certification.

The minimum requirement for renewal of a BAT's certification to conduct breath alcohol analyses shall be:

Demonstration by the BAT of competence to perform satisfactory breath alcohol analyses. The examination should be conducted using alcoholic reference sample equipment under the direct and close scrutiny of an examiner designated by the licensing authority. The BAT should be evaluated on the basis of ability to:

1. Use proper techniques.
2. Obtain proper instrumental results.
3. Follow established procedures including but not limited to the

operation of the instrument and allied equipment and the proper reporting of procedures and analysis results.

The satisfactory completion of a refresher course of at least four hours duration, the content of which should include:

1. A brief review of the theory and operation of the breath test equipment.
2. A detailed review of the breath test and reporting procedures.
3. A discussion of procedural updates resulting from recent court decisions and state legislation.
4. A discussion of current problems in the field of breath testing.
5. A written examination on the material presented in the refresher course and during the basic course of instruction.

The renewal of the certification should be denied when the BAT:

1. Neglects to follow established procedures.
2. Uses other than a proper technique, or
3. Fails the written examination.

When renewal of the certification has been denied the BAT should be given the reason for failure and should be given a definite period of time after which he/she could again take the recertification examinations. Failure a second time should require that the candidate attend and satisfactorily complete the basic course of instruction for certification as a BAT.

Technical Supervisor Certification and Re-Certification

1. Training

It is recommended that any person who is a technical supervisor or an administrator or a Breath Testing Program successfully complete a course of instruction on the Technical Supervision of a Breath Test Program. The instructors of a technical supervision course must be nationally recognized in their area of instruction. The course should include 4 hour blocks of instruction in each of the following areas:

1. Pharmacology of Alcohol
2. Alcohol and Driving/Equipment operation
3. Theory of Breath Alcohol Testing
4. Breath Alcohol Instrumentation
5. Legal Aspects of the Act and Alcohol Associated with Workplace Testing.
6. Alcohol Program Administration

Additional topics that could be included in a Technical Supervisors Course are:

1. Instrument maintenance and calibration.
2. Course of instruction for a Breath Alcohol Technician Training Course.
3. Laboratory training methods for a Breath Alcohol Technician Training Course.
4. Model programs and recommendations of the National Safety Council, Committee on Alcohol and other Drugs.

2. Certification

The minimum requirement for certification as a Technical Supervisor should be at least equivalent to the qualifications set out above. The certification should indicate the breath testing equipment that the supervisor is certified to operate.

3. Licensing

An individual upon satisfactory completion of a recognized Technical Supervisor's course should be eligible to be licensed by an appropriate authority to supervise in the breath test program.

It is recommended that the initial supervisor's license be valid for a period not to exceed two years.

Renewed licenses should be valid for a period not to exceed five years. In order to maintain a valid license it is recommended that the Technical Supervisor:

- a. Be actively engaged in the technical supervision of a breath test program.
- b. Demonstrate to the licensing authority at any time required the continued competence listed in b under License Renewal.

4. License Renewal

The minimum requirements for renewal of a supervisor's license should be the successful completion of a refresher course of at least eight hours duration, the content of which should include at least the following:

- a. Lecture and discussion of the following subject matter:
 1. The theory and application of breath testing instruments and allied equipment.
 2. Instrument maintenance and calibration including equipment for reference sample analyses.
 3. A review of the absorption, distribution and elimination of alcohol.
 4. A discussion of legal aspects relative to the breath testing program.
 5. A discussion of the administration and supervision of the breath test program.
 6. A written examination and/or an oral interview as prescribed by the Licensing authority.
- b. A demonstration by the Technical Supervisor of continued competence to:
 1. Supervise the Breath Alcohol Technicians.
 2. Provide expert testimony concerning the breath test equipment, the testing technique employed, and the Breath Alcohol Technicians.
 3. Calibrate and maintain the breath test instrument and allied equipment.
 4. Perform reliable breath alcohol analyses.

Calibration Technicians

3. Licensing

Upon satisfactory completion of a recognized Breath Alcohol Technician's course, an individual should be eligible to be licensed by an appropriate authority to conduct breath alcohol analyses. A technician should be eligible for a license to operate only that breath testing equipment for which the technician has received certification. The license should specify the make and model of each type of breath testing instrument.

It is recommended that initial licenses to conduct breath alcohol analysis be valid for a period not to exceed one year and that renewed licenses be valid for a period not to exceed two years. In order to maintain a valid license, it is recommended that the technician:

- Conduct a minimum of three breath alcohol instrument analyses each working month consisting of either reference sample analyses or actual subject analyses.
- Demonstrate competence to perform satisfactory breath analyses to the Technical Supervisor at any time required and at intervals not to exceed one year.

JA license may be revoked, suspended, or canceled for cause by the licensing authority, or may be voluntarily surrendered by the licensee.

4. License Renewal

The minimum requirement for renewal of the technician's license to conduct breath alcohol analyses shall be:

A demonstration by the technician of competence to perform satisfactory breath alcohol analyses. The examination should be conducted using alcoholic reference sample equipment under the direct and close scrutiny of an examiner designated by the licensing authority. The technician should be evaluated on the basis of ability to:

1. Use proper techniques.
2. Obtain proper instrumental results.
3. Follow established procedures

The renewal of the license should be denied when the Technician:

When renewal of the license has been denied the technician should be given the reason for failure and should be given a definite period of time after which he/she could again take the re-licensing examinations. Failure a second time should require that the candidate attend and

satisfactorily complete the basic course of instruction for certification as a breath testing technician.

A technician whose license has either expired or lost validity should not be eligible for license renewal until satisfactorily completing the procedure for license renewal or, failing that, the basic course for certification.

Appendix D
RECOMMENDATIONS OF THE AD HOC COMMITTEE
ON

TESTING AND TRAINING

1968

NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS

PREAMBLE

For the purposes of traffic law enforcement and in connection with programs for the control of alcohol in respect to traffic safety, this Ad Hoc Committee concurs unanimously in making the following recommendations in the light of currently available information.

I. SPECIMENS

- A. The biological specimens of choice for the determination of ethyl alcohol are those of blood or breath.
- B. Suitable breath specimens are those in which the ethyl alcohol was substantially in equilibrium with the alcohol of the pulmonary arterial blood plasma. "Deep lung air" (alveolar air) is such a specimen.
- C. Urine. Because of various problems in the interpretation of the results of analyses of urine specimens for alcohol, which cannot readily be overcome in law enforcement practice, analysis of urine for the purpose of determining blood alcohol concentration is to be discouraged except under the strictly controlled conditions employed in determining renal solute clearances.

II. PROCEDURES FOR ANALYSIS

A. Procedural Controls

1. Analytical procedures for breath alcohol analysis should include the following controls in conjunction with the testing of each subject:
 - a. Continuous observation of the subject for at least fifteen (15) minutes prior to collection of the breath specimen, during which period the subject must not have ingested alcoholic beverages or other fluids, regurgitated, vomited, eaten or smoked.
 - b. A blank analysis.
 - c. Analysis of a suitable reference or control sample, such as air air equilibrated with a reference solution of known alcohol content at a known temperature, the result of which analysis must agree with the reference sample value within the limits of + 0.01% WN. This analysis shall immediately precede or immediately follow the analysis of the breath of the subject.

2. Analytical procedures for blood alcohol analysis should include the following controls in conjunction with any sample or series of samples analyzed sequentially or simultaneously:

a- A blank analysis where appropriate.

b- Analysis of a suitable reference or control blood sample of known alcohol content within the range of 0.10 to 0.30% W/V, the result of which analysis must agree with the reference sample value within the limits of $\pm 0.01\%$ W/V.

B. Reporting of Results

Results of alcohol determinations expressed as blood alcohol concentrations be reported to the second decimal place if expressed in terms of W/V or W/W, or to the same degree of precision if reported in other units of concentration such as milligrams per 100 milliliters.

C. Quantification of Breath Specimens

The quantity of breath analyzed for its alcohol content shall be established only by direct volumetric measurement, or by collection and analysis of a fixed breath volume.

III. STANDARDS OF TRAINING

In order to implement and monitor the application of the above and other applicable standards, the Ad Hoc Committee unanimously recommends the following minimum standards of training. For the purposes of the section, the activities of a program of chemical testing for alcohol will be classified as follows:

- Interpretation
- Scientific Direction
- Technical Supervision
- Sample Analysis
- Remote Sampling

Although the titles assigned to the individuals associated with these several activities may vary in different jurisdictions, their functions generally will be expected to remain the same.

These recommendations are intended to describe the minimum training and educational requirements deemed necessary to ensure efficient and dependable administration of a program of chemical testing for alcohol. They are not intended to provide guidelines for all aspects of a chemical test program.

A. Interpretation

In any chemical testing program there should be readily available professional personnel to provide expert testimony and to interpret the pharmacological and physiological significances of the analytical results.

No specific training recommendations are made at this level of professional competence in the light of adequacy of the basic academic and professional education of such individuals.

B. Scientific Direction

A program of chemical testing for alcohol must be under the supervision of a scientific director. The director should have at least a baccalaureate degree in one of the natural sciences or other appropriate field, and, in addition, specialized knowledge may be obtained through attendance at a course of instruction specifically designed for this purpose, or by nine months residency training in a recognized laboratory carrying out such functions.

If the program includes the direction of a laboratory that carries out direct analyses of blood samples for alcohol, the director and the analysts under his supervision should possess at least the educational and experience qualifications set forth for these personnel categories in Title 20, Code of Federal Regulations, Chapter IH, Part 405, Paragraphs 405.1312, 405.1313, 405.1315, or equivalent educational and experience qualifications in other appropriate disciplines such as chemistry, criminalistics, or toxicology or combination thereof

C. Technical Supervision

Technical supervision of chemical tests for alcohol must be exercised continually. The responsibilities of the technical supervisor include field inspection, maintenance and calibration of breath testing equipment, and training and re-evaluation of the breath test technicians under his jurisdiction. Further, he is responsible for periodic re-examination of the operators under his jurisdiction to ensure technical knowledge and competence.

For individuals exercising the preceding functions, the minimum qualifications are:

1. High School Graduation or its equivalent.
2. Accreditation as an operator of the chemical test method he is to supervise, or possession of equivalent knowledge to qualify him as such.
3. Satisfactory completion of a technical supervisors' course, the content of which should include:
 - a) Advanced survey of current information on the physiology and pharmacology of alcohol.

- b) Operational principles and theories applicable to the program.
- c) Instrument maintenance and calibration.
- d) Legal aspects of alcohol and traffic.
- e) Public relations aspects of alcohol and traffic.
- f) Principles of instruction.

D. Breath Testing Technicians

In lieu of formal educational requirements, a pre-course screening test may be used to determine the technical aptitude of prospective technicians. The recommended course of instruction includes the following subject matter: (The term "hour" as used in these recommendations refers to a 60-minute period of instructional time.)

1. A minimum of three (3) hours of instruction on alcohol and the human body.
2. A minimum of three (3) hours of instruction on the operational principles of the selected testing method which is to include:
 - a) A functional description of the testing method.
 - b) A detailed operational description of the method with demonstrations.
3. A minimum of five (5) hours of instruction on the legal aspects of chemical tests generally and of the particular method to be employed.
4. A minimum of three (3) hours of instruction on supplemental information which is to include nomenclature appropriate to the field of chemical tests for alcohol.
5. A minimum of ten (10) hours of laboratory participation using appropriate equipment. Laboratory practice will include the use of reference alcohol samples, as well as the testing of actual drinking subjects.
6. A minimum of one hour of formal examination for purposes of determining the competency and qualifications of the technician or trainee.

E. Remote Collection of Specimens

This instruction should be provided within the context of local law enforcement training in the

subject area of traffic law enforcement procedures. Additional instruction should be given where applicable in the remote collection of blood or breath specimens for subsequent analysis.

- 1- Blood Collection-- In lieu of extensive training in this specific area, a standard collection kit should be utilized. It should include detailed instructions for the medical personnel responsible for the withdrawal of the blood specimen and emphasize pitfalls to be avoided. Law enforcement officers are also to be acquainted with the proper employment of this kit in the collection and submission of the blood specimens for subsequent analysis.
- 2- Breath Collection -- Law enforcement officers who are to collect breath specimens should be acquainted with those technical and environmental factors that might affect the validity of the subsequent analysis. They should receive instruction in the principles and use of any collecting device employed sufficient to become proficient in its use; should be acquainted with the scientific significance of the test to be conducted and should be acquainted with the proper techniques for the submission of collected specimens.

This Ad Hoc Committee estimates training for this activity will require a minimum of three (3) hours of instruction.

Continued training should be provided to communicate new developments apropos of the selected testing method and other aspects of chemical testing for alcohol.

Appendix E

RECOMMENDATIONS FOR THE
**TRAINING OF TECHNICAL SUPERVISOR
OR ADMINISTRATOR OF A BREATH ALCOHOL TESTING PROGRAM**

1986

**NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS**

RECOMMENDATION FOR THE TRAINING OF TECHNICAL SUPERVISOR OR ADMINISTRATOR OF A BREATH ALCOHOL TESTING PROGRAM

It is recommended that any person who is a technical supervisor or an administrator of a Breath Testing Program successfully complete a course of instruction on the technical supervision of a Breath Test Program. The instructors of a technical supervision course must be nationally recognized in their area of instruction. The course should include 4 hour blocks of instruction in each of the following areas:

- 1- Pharmacology of Alcohol
- 2- Alcohol and Driving
- 3- Theory of Breath Alcohol Testing
- 4- Breath Alcohol Instrumentation
- 5- Legal Aspects
- 6- Alcohol Program Administration

Additional topics that could be included in a Technical Supervisors Course are:

- 1- Instrument maintenance and calibration.
- 2- Course of instruction for a Breath Test Technician Training Course.
- 3- Laboratory training methods for a Breath Test Technician Training Course.
- 4- Model programs and recommendations of the National Safety Council, Committee on Alcohol and Other Drugs.

Appendix F

RECOMMENDATIONS OF THE AD HOC COMMITTEE ON THE REPORT

PERIODIC REQUALIFICATION AND CONTINUED EDUCATION AND TRAINING OF PERSONNEL ENGAGED IN THE PERFORMANCE OF CHEMICAL TESTS FOR ALCOHOLIC INFLUENCE

Amended 1980

**NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS**

BREATH TESTING TECHNICIAN

Certification

The minimum requirement for certification as a Breath Testing Technician¹ is the satisfactory completion of a basic course of instruction which is at least the equivalent of that set out by the Ad Hoc Committee on Testing and Training April 29-30, 1968 (See Appendix D.) The certification should specify the equipment that the technician is certified to operate.

Licensing

An individual upon satisfactory completion of a recognized Breath Testing Technician's course should be eligible to be licensed by an appropriate authority to conduct breath alcohol analyses.

A technician should be eligible for a license to operate only that breath testing equipment for which the technician has received certification. The license should specify the make and model of each type of breath testing instrument.

It is recommended that the initial license to conduct breath alcohol analysis be valid for a period not to exceed one year and that renewed licenses be valid for a period not to exceed two years. In order to maintain a valid license, it is recommended that the technician:

- 1- Conduct a minimum of three breath alcohol instrument analyses each working month consisting of either reference sample analysis or actual subject analysis,
- 2- Demonstrate competence to perform satisfactory breath analyses to the Technical Supervisor at any time required and at intervals not to exceed one year.

A license may be revoked, suspended, or canceled for cause by the licensing authority, or may be voluntarily surrendered by tire licensee.

License Renewal

The minimum requirement for renewal of the technician's license to conduct breath alcohol analyses be:

- 1- a demonstration by the technician of competence to perform satisfactory breath analyses. The examination should be conducted using alcoholic reference sample equipment under the direct and close scrutiny of an examiner designated by the licensing authority. The technician should be evaluated on the basis of ability to:
 - a) use proper techniques,

¹ An operator of an evidential quantitative breath testing instrument used to determine the blood alcohol concentration.

- b) obtain proper instrumental results,

c) follow established procedures including but not limited to the operation of the instrument and allied equipment and the proper reporting of procedures and analysis results.

2- the satisfactory completion of a refresher course of at least four hours duration, the content of which should include:

- a) a brief review of the theory and operation of the breath test equipment,
- b) a detailed review of the breath test and reporting procedures,
- c) a discussion of procedural updates resulting from recent court decisions and state legislation,
- d) a discussion of current problems in the field of breath testing,
- e) a written examination on the material presented in the refresher course and during the basic course of instruction.

The renewal of the license should be denied when the technician:

- 1. neglects to follow established procedures,
- 2. uses other than a proper technique, or
- 3. fails the written examination.

When renewal of the license has been denied the technician should be given the reason for failure and should be given a definite period of time after which the technician could again take the relicensing examinations.

Failure a second time should require that the candidate attend and satisfactorily complete the basic course of instruction for certification of a breath testing technician.

A technician whose license has either expired or lost validity should not be eligible for license renewal until satisfactorily completing the procedure for license renewal or the basic course for certification.

TECHNICAL SUPERVISOR

Certification

The minimum requirement for certification as a Technical Supervisor be at least the equivalent of the qualifications set out by the Ad Hoc Committee on Testing and Training of 29-30 April 1968 (See Appendix D). The certification should indicate the breath testing equipment that the supervisor is certified to operate.

Licensing

An individual upon satisfactory completion of a recognized Technical Supervisor's course should be eligible to *be* licensed by an appropriate authority to supervise in the breath test program.

It is recommended that the initial supervisor's license be valid for a period not to exceed two years. Renewed licenses should be valid for a period not to exceed five years. In order to maintain a valid license it is recommended that the Technical Supervisor:

- 1 be actively engaged in the technical supervision of a breath test program, and
- 2 demonstrate to the licensing authority at any time required the continued competence listed in 2 under License Renewal.

License Renewal

The minimum requirements for renewal of a supervisor's license should be the successful completion of a refresher course of at least eight hours duration, the content of which should include at least the following:

1. Lecture and discussion of the following subject matter:
 - a. the theory and application of breath testing instruments and allied equipment,
 - b. instrument maintenance and calibration including equipment for reference sample analysis,
 - c. a review of the absorption, distribution and elimination of alcohol,
 - d. a discussion of legal aspects relative to the breath testing program,
 - e. a discussion of the administration and supervision of the breath test program, and
 - f. a written examination and/or an oral interview as prescribed by the licensing authority.

2. a demonstration by the Technical Supervisor of continued competence to:
 - a. supervise the Breath Testing Technicians,
 - b. provide expert testimony concerning the breath test equipment, the testing technique employed, and the Breath Testing Technicians,
 - c. calibrate and maintain the breath test instrument and allied equipment, and
 - d. perform reliable breath alcohol analysis.

BLOOD ALCOHOL ANALYST

Certification

The minimum requirement for certification as an analyst to conduct forensic blood alcohol analyses be at least the equivalent of the qualifications recommended by the Ad Hoc Committee on Testing and Training of April 29-30, 1968. (See Appendix D and Attachment 1 immediately following.)

Licensing

An individual upon certification as a blood alcohol analyst should be eligible to be licensed by an appropriate authority to conduct forensic blood alcohol analyses. It is recommended that the analyst's license be valid for a period not to exceed two years.

In order to maintain a valid license the analyst must satisfactorily analyze blood specimens submitted for performance monitoring by the licensing authority. Where possible, it is recommended that such specimens be submitted in a manner that the analyst is unaware that they are for evaluation purposes. Check specimens should receive the same care and attention as a specimen submitted for forensic blood alcohol analysis.

License Renewal

The minimum requirements for renewal of the analyst's license should be a demonstration of continued competence to conduct forensic blood alcohol analyses by satisfactorily analyzing at least three reference blood specimens without prior knowledge of the target values.

Attachment 1

EXTRACTS FROM CONDITIONS FOR COVERAGE OF SERVICES OF INDEPENDENT LABORATORIES FEDERAL HEALTH INSURANCE FOR THE AGED (CODE OF FEDERAL REGULATIONS, TITLE 20, CHAPTER III, PART 405)

Standard Technologists - qualifications. Each clinical laboratory technologist possesses a current license as a clinical laboratory technologist issued by the State, if such licensing exists, and meets the requirements of subparagraphs (1), (2), (3), (4), or (5), or (5) and (6) of this paragraph:

1. Successful completion of a full course of study which meets all academic requirements for a bachelor's degree in medical technology from an accredited college or university.

2. Successful completion of 3 academic years of study (a minimum of 90 semester hours or equivalent) in an accredited college or university that met the specific requirements for entrance into, and the successful completion of a course of training of at least 12 months in, a school of medical technology approved by the Council on Medical Education and Hospitals of the American Medical Association.

3. Successful completion in an accredited college or university of a course of study which meets all academic requirements for a bachelor's degree in one of the chemical, physical, or biological sciences, and, in addition, at least 1 year of pertinent experience and/or training covering the specialty(ies) or subspecialty(ies) in which he performs tests, provided the combination has given the individual the equivalent in such specialty(ies) or subspecialty(ies) of the education and training described in subparagraph (1) or (2) of this paragraph.

4. Successful completion of 3 years (90 semester hours or equivalent) in an accredited college or university with a distribution of courses as shown below, and, in addition successful experience and/or training covering several fields of medical laboratory work of such length (not less than 1 year), and of such quality that this experience or training, when combined with the education will have provided the individual with education and training in medical technology equivalent to that described in subparagraph (1) and (2) of this paragraph. Distribution of course work: (Where semester hours are stated, it is understood that the equivalent in quarter hours is equally acceptable. The courses must have included lecture and laboratory work. Survey courses are not acceptable.)

(i) For those whose training was completed prior to September 15, 1963: at least 24 semester hours in chemistry and biology courses of which not less than 9 semester hours must have been in chemistry and must have included at least 6 semester hours in inorganic chemistry, and not less than 12 semester hours must have been in biology courses pertinent to the medical sciences.

(ii) For those whose training was completed after September 15, 1963: 16 semester hours in chemistry courses which included at least 6 semester hours in organic chemistry and are

acceptable toward a major in chemistry; 16 semester hours in biology courses which are pertinent to the medical sciences and are acceptable toward a major in the biological sciences; and 3 semester hours of mathematics.

5. For a period ending June 30, 1971, an exception to the requirements in subparagraphs 1,2, 3, and 4 of this paragraph may be made if (i) the technologist was performing the duties of a clinical laboratory technologist on, or within the 5 years preceding, July 1, 1966, and (ii) the technologist has had at least 10 years of pertinent clinical laboratory experience prior to July 1, 1966: Provided, that a minimum of 30 semester hours of credit toward a bachelor's degree from an accredited institution with a chemical, physical or a biological science as his major subject or 30 semester hours in an approved school of medical technology shall reduce the required years of experience by 2 years, with any additional hours further reducing the required years of experience at the rate of 15 hours for 1 year.

6. The technologist who meets the requirements under subparagraph 5 of this paragraph may continue to qualify under the program after June 30, 1971, if he has performed the duties of a clinical laboratory technologist for at least 2 years between July 1, 1966 and July 1, 1971, or during the IO-year period in subparagraph 5: (i) in a clinical laboratory - with a director at the doctoral level - of a hospital, university, health department, or medical research institution; or (ii) in a State which regulates clinical laboratory personnel, in a clinical laboratory acceptable to that State; or (iii) in a laboratory approved under the supplementary medical insurance program: Provided also, that where qualifying years in a laboratory described in (i) or (ii) of this paragraph are obtained after June 30, 1966, the laboratory meets applicable conditions under the health insurance program

Appendix G

RECOMMENDATION For the

TRAINING AND CERTIFICATION OF BREATH TEST OPERATORS ON ADDITIONAL BREATH TEST INSTRUMENTS

1983

**NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS**

Recommendations for the Training and Certification of Breath Test Operators on Additional Breath Test Instruments

Prerequisite: Any breath test operator to be trained and/or certified on additional breath test instruments must have been previously trained and certified as a breath test operator in accordance with the original certification recommendations of this committee. In addition, the operator must be current in certification as prescribed in the revised periodic requalification recommendations of this committee.

Recommended Course of Instruction: (Total 12 hours)

1. Instruction on the operational principals of the selected breath test instrument or method to include: (Recommended 4 hours of instruction)
 - A. A functional description (theory) of analysis of the specific breath test instrument or method.
 - B. A detailed operational description of the breath test instrument or method with demonstrations.
2. Instruction on proper reporting procedures. (Recommended 2 hours of instruction)
3. Instruction on nomenclature specific to the selected breath test instrument or method to include a review of metrics or mathematics involved in the testing procedure. (Recommended 2 hours of instruction)
4. Laboratory participation using the specific equipment including practice with reference alcohol samples. Testing drinking subjects would be optional. (Recommended 12 hours of instruction including 1 hour for practical examination using a minimum of five unknown reference samples or completion of a minimum of 50 practice analysis and practical examination.)
5. Supplemental instruction to include: (Recommended 3 hours of instruction)
 - A. Program regulations and policies.
 - B. Legal or physiological aspects specific to the methods or instrument employed.
6. Written Examination. (Recommended 1 hour of instruction)

Recommendations for Certification of Breath Test Operators on Additional Breath Test Instruments:

1. Completion of the recommended course of instruction.
2. Successful completion of both a written and practical examination as recommended in the original certification course.
3. Duration and expiration of certification on the additional breath test instruments or method would be the same as those outlined in the recommendations for original certification.

**Recommendations for the Training and Certification of Breath Test Operators
on Additional Breath Test Instruments of the Automated Type.
(Operator Non-intensive)
1984**

Forward: The following recommendations should be considered as a minimum recommendation of time in a subject area. If a program, has no changes in a subject area then a ½ hour review of that subject material may be substituted.

Prerequisite: Any breath test operator to be trained and/or certified on additional breath test instruments must have been previously trained and certified as a breath test operator in accordance with the original certification recommendations of this committee. In addition, the operator must be current in certification as prescribed in the revised periodic requalification recommendations of this committee.

Recommended Course of Instruction: (Total 11 - 13 hours)

1. Instruction on the operational principals of the selected breath test instrument or method to include: (4 hours)
 - A. The theory and principals under which the instrument operates.
 - B. A detailed operational description of the breath test instrument including nomenclature and demonstrations.
 - C. An overview of the internal components of the instrument relating the theory an operational procedure to the internal functions.
2. Detailed instructions on forms and reporting procedures.

3. Laboratory participation employing the instrumentation upon which the operator is to be certified. (4 - 6 hours)
 - A. Practice testing should include reference samples of various alcohol concentrations, possible interfering substances and mouth alcohol to total a minimum of 50 samples analyzed on the instrumentation.
 - B. A laboratory practical examination which is directly related to operational procedures.
 - C. The testing of drinking subjects is optional.
4. Legal aspects specific to the operational procedure and the instrument. (1 hour)
5. Written exam and course review. (1 hour)

Appendix H

RECOMMENDATIONS OF THE AD HOC COMMITTEE
ON

QUANTITATIVE BREATH ALCOHOL INSTRUMENTATION

1971

**NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS**

INTRODUCTION

Facts disclosed through the implementation of the 1966 Highway Safety Act have emphasized that alcohol misuse by drivers is the principal human factor in fatal traffic crashes. This has resulted in the multiplication of countermeasures to deal with the drinking driver.

Involved in almost every program is an increase of use of breath alcohol instruments. Standard criteria for selection of such instruments by enforcement agencies, never before confronted with the need to choose from among numerous devices, have not been available. This has resulted in much confusion and indecision. The proliferation of such instrumentation further confounds the situation. This has created a genuine need for scientific appraisal of the capabilities of instruments and their approval or disapproval. There is also an urgent need for quality control of approved instruments.

This Ad Hoc Committee has developed a set of standards, criteria, and recommendations to fill this pressing need. No time should be lost in putting this program into action so that possible commitment to substandard methods will be avoided. The following document is intended to provide guidelines to manufacturers, evaluators, program directors, and user agencies so that decisions will be based on well-advised judgment.

STANDARDS FOR QUANTITATIVE BREATH ALCOHOL INSTRUMENTS

1. Instruments used for quantitative breath alcohol (ethanol) analyses must be capable of collecting and presenting a specimen of deep lung breath (substantially alveolar in composition) for analysis.
2. If a volume of breath is analyzed, it must be measured volumetrically at a constant known temperature.
3. Loss of alcohol (from the breath specimen) through condensation shall be prevented by maintaining the breath specimen at a temperature sufficiently above body temperature or by other satisfactory means.
4. When vapors of a known alcohol concentration are analyzed over the range corresponding to blood alcohol concentrations of 0.05% W/V to 0.15% W/V, the results of a minimum of 50 or so consecutive analyses at any one concentration shall have a standard deviation not in excess of 0.0025% W/V. For blood alcohol concentrations from 0.15% through at least 0.30% W/V, the standard deviation of a minimum of 50 consecutive determinations at any one concentration shall not exceed 2% of the expected value.
5. The instrument must be capable of performing a blank analysis on ambient air, free of

alcohol and other interfering substances, that yields an apparent alcohol concentration of less than 0.01%W/V.

6. Substances that are produced endogenously and appear in the breath shall not contribute to the apparent blood alcohol concentration by more than 0.01%.
7. Instruments which singly or in combination collect a deep lung breath specimen and temporarily store the specimen or its contained alcohol and subsequently complete the analysis (remote sampling devices) shall meet all stated performance requirements. Such instruments (remote sampling devices) shall be designed so that the result obtained is independent of barometric pressure or designed so that the result obtained is correctable for barometric pressure change if such correction is necessary.
8. Controlled temperatures within instrument components shall be stated in terms of the preferred temperature and the permissible range.
9. Instruments shall be designed to comply with generally recognized safety requirements.
10. Instrument manufacturers shall provide with each instrument a precise set of specifications which describe the features of the instrument concerned in the evaluation of its performance. A set of detailed operating instructions shall be supplied with each instrument. Operating instructions shall be compatible with performance standards and with performance evaluation requirements.

TYPE AND NATURE OF MONITORING AND APPROVING AUTHORITY

It is recommended that there be one authoritative body, suitably qualified, to examine quantitative breath alcohol instruments offered for sale or use in traffic law enforcement, and to ascertain whether or not such instruments meet established criteria. Instruments which have been determined to meet the established criteria shall be approved and a list shall be published and made available for use.

This authority shall be empowered to make approvals following examination and shall be provided with the means of implementing a testing and evaluation program.

Through both supplier and user sampling, this body shall have the responsibility for monitoring of approved instruments to ascertain that criteria compliance is being continuously maintained. The authority conferred upon this body shall include the following functions:

1. Original approval
2. Reevaluation and testing
3. Interdiction of usage
4. Suspension or cancellation of approval
5. Reapproval
6. Coordination of reciprocal information relative to instrumentation performance through

experience with users.

The approving authority may authorize states and political subdivisions which have adopted compliance criteria equal to or exceeding national standards to approve temporary use of such instruments as are found to meet criteria for use in their own jurisdiction, subject to later approval at the national level.

The approving authority shall design and adopt such regulations and procedures as are necessary to enable the completion of approval procedures in a minimum of elapsed time.

ATTACHMENT 1 consists of a discussion of some considerations which may be taken into account in the selection of the approving authority which will be necessary to implement and execute the recommended program.

TRAINING

The process capability and performance standards promulgated by this Committee must be enforced if countermeasures to deal with the drinking driver are to be effective. Because evaluation based on these standards demands highly specialized skills and knowledge, a special training program is indicated. Its nature, objectives, curriculum content, scope, duration, etc., must be geared to the responsibilities and tasks of the person who is to direct the program. This person was identified by the Ad Hoc Committee on Testing and Training of 29-30 April 1968, as the Scientific Director. That Ad Hoc Committee on Testing and Training made the following recommendation:

"The Scientific Director should have at least a baccalaureate degree in one of the natural sciences or other appropriate field, and, in addition, specialized knowledge in the field of chemical tests for alcohol. This specialized knowledge may be obtained through attendance at a course of instruction specifically designed for this purpose, or by nine months residency training in a recognized laboratory carrying out such functions."

As a basis for planning a training program, the responsibilities and tasks of the Scientific Director have been delineated more specifically by the present Ad Hoc Committee. This was considered desirable because the committee concluded that the specific responsibilities of testing, selecting and monitoring quantitative breath alcohol instruments are appropriate parts of the Scientific Director's responsibilities. Nevertheless, the specific responsibilities and tasks involved in the specific area of testing, selecting and breath alcohol instruments are appropriate parts of the Scientific Director's responsibilities. Nevertheless, the specific responsibilities and tasks involved in the specific area of testing, selecting and monitoring quantitative breath alcohol instruments are delineated following the overall responsibilities and tasks of the Scientific Director. In the event it is deemed desirable to isolate this particular function from the total functions of the Scientific Director, the specifications for this area are provided. The training program outlined later encompasses the subject matter needed for preparation of candidates for Scientific Director.

When attempting to outline a more limited, specialized training program for the specialist in the testing, selecting and monitoring of quantitative breath alcohol instrumentation, it became apparent that such training cannot be effectively provided out of context of the total system. Therefore, while determining the type and nature of the training needed by the specialist, it was concluded and is now recommended that he receive substantially the total training program, provided for the Scientific Director outlined hereinafter. The following is the more detailed listing of the duties, responsibilities, and tasks of the Scientific Director and staff of the Breath Alcohol Testing Program:

- Collect and analyze data and maintain records.
- Study legislation, recommendations of national bodies, legislation needed in his jurisdiction; recommend legislation and advise legislative bodies.
- Render witness services when called upon.
- Keep abreast of scientific literature in the field.
- Conduct a program of public information and public relations.
- Implement and maintain a program of field inspection, preventive maintenance and calibration of breath testing equipment.
- Train, certify, evaluate, retrain and recertify breath test instrument operators.
- Evaluate periodically the effectiveness of the breath testing program and its components.
- Develop policies and procedures for all aspects of the program for the guidance of all personnel within the jurisdiction.
- Plan, obtain, administer, and account for a program budget.
- Maintain liaison and official relations with federal, state, and local officials, associations of officials, and private organizations involved in or concerned with the breath testing program.
- Direct subordinates and perform the many additional responsibilities involved in the day-to-day administration.

In addition to the foregoing overall administrative and scientific responsibilities, the committee analyzed and delineated the specific responsibilities and tasks of the Scientific Director involved in testing, evaluating, selecting, and approving breath testing instruments for his jurisdiction and establishing quality control.

They are:

1. Test and evaluate instruments being considered for use in traffic law enforcement.
2. Test and approve each instrument to be used by agencies in his jurisdiction.
3. Identify possible weakness or idiosyncrasies of types of instruments and their components, including potential problems in the use of the instruments or materials, in order to insure correct preventive maintenance and inspection procedures.
4. Advise purchasers (as well as manufacturers and the national testing agency) of problems which may develop in the course of instrument use and suggest how to avoid or counteract them.
5. Develop and implement a quality control system to insure continued reliability of the instruments and their use.
6. Develop the particular elements of quality control which must be performed by supervisors, monitors, and operators.
7. Participate in the planning and conduct of training for personnel of the breath alcohol testing system with particular reference to the procedures and precautions to be taken to achieve quality control and preventive maintenance.
8. Evaluate the political legal and economic constraints bearing upon the selection and application of breath alcohol testing instruments in particular political subdivisions by considering parameters such as population density, attitudes toward alcohol usage, budget and personnel available.

Based upon the responsibilities and tasks --administrative, scientific, general, and specific -- identified in the above listing, an outline for a training program for prospective Scientific Directors was developed by the committee.

Candidates for the training shall have at least the qualifications set out for the Scientific Director, namely baccalaureate degree. The curriculum considered necessary to prepare candidates for the position of Scientific Director should include the following subjects or units:

1. The impact of alcohol upon traffic safety.
2. Agencies involved in programs dealing with alcohol and highway safety and their functions.
3. Federal standards and programs.
4. Physiological aspects of alcohol in the human body.
5. Pharmacological aspects of alcohol in the human body.
6. Legal and legislative aspects.
7. Prosecution and defense tactics.
8. Sources of scientific information.
9. Current instrumentation for breath alcohol measurement.
10. Criteria for instrument evaluation.
11. Applicable statistical methods.
12. Principles of measurement (primary, secondary, reference standard).
13. Review of scientific principles underlying breath alcohol analysis and instruments.
14. Methods of conducting blood-breath correlation studies.
15. Management principles.
16. Principles of quality control.
17. Records systems for administrative control of systems.
18. Public relations aspects and public information-education programs.
19. Development of training programs for the system.
20. Methods of evaluation of program effectiveness.

ATTACHMENT 1

CONSIDERATIONS WHICH MAY BE TAKEN INTO ACCOUNT IN THE SELECTION OF AN APPROVING AUTHORITY

Examples of typical agencies which might be selected as the approving authority are suggested as follows:

1. Federal Agencies
 - U.S. Department of Transportation.
 - National Bureau of Standards.⁶
 - Department of Health, Education, and Welfare and its subdivisions.
 - National Aeronautics and Space Administration.

2. Independent Professional Organizations
 - Institutes.
 - Foundations.
 - Universities.
 - National Safety Council.
 - American Medical Association.
 - National Academy of Sciences -- National Research Council.

Discussion of possible advantages and disadvantages of federal agencies versus independent agencies:

1. Advantages of Federal Agencies:
 - Continuity of staff and programs.
 - Legal status.
 - Regulatory capability.
 - Financing.
 - Close supervision.

2. Disadvantages possible in Federal Agencies:
 - Administrative complexities.
 - Time for execution.
 - Political interference by special interests.
 - Budgetary restrictions.

⁶ NBS is now called National Institute of Standards and Technology, NIST.

3. Advantages of Independent Agencies

- Less possibility of political interference.
- Availability of technical facilities and personnel.

4. Disadvantages of Independent Agencies

- Supervision Problems
- Lack of regulatory capabilities.
- Potential inconsistencies with existing policies and programs.
- Questionable credibility based on lack of prestige and past demonstration of performance.
- Funding problems.

Suggestions for possible contracting agencies to assist the approving authority if necessary:

1. Forensic Sciences Foundation, Inc.
2. Research Institutes.
3. Private analytical chemistry enterprises with experience in referee work.

Appendix I

RECOMMENDATIONS OF THE AD HOC COMMITTEE
ON
BREATH ALCOHOL SCREENING TESTS

1972

NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS

1.0 PURPOSE

Current emphasis on countermeasures against the drinking driver has been precipitated by overwhelming evidence of the heavy contribution which the drinking driver makes to highway deaths and injuries. One of the principal countermeasures is stepped-up enforcement.

An examination of BAC (blood alcohol concentration) distributions resulting from typical law enforcement practice, particularly that of enforcement agencies responsible for coverage of large geographic areas, indicates that the quantitative tests carried out using presently available fixed-location breath-test equipment should be supplemented by preliminary on-site breath screening tests for alcohol in order to provide more frequent identification of drivers with significant BACs. Screening devices that can be used on site to provide this type of objective information have been appearing on the market and several have been in use for a number of years. Their use is increasing dramatically.

In order to provide guidelines for selecting, evaluating and approving screening devices and to insure the greatest public benefit from their use, as well as adequate protection of the driving public from unnecessary inconvenience, the Ad Hoc Committee on Breath Alcohol Screening Tests recommends the performance standards and evaluation criteria presented in this report.

2.0 DEFINITION OF TERMS

The following are definitions of terms used in this report:

- 2.1 Breath Alcohol Screening Test A breath alcohol screening test is a test, using a breath sample, designed to indicate whether an individual's blood alcohol concentration is greater than a specified BAC.
- 2.2 Mid-Point Value The mid-point value is the specified BAC, designated by the manufacturer, at which the test is designed to screen the tested subjects.
- 2.3 Critical Region The critical region is a range of test result indications in BAC units with a midpoint value designated by the manufacturer within which range the test result is uncertain.
- 2.4 Positive Result A positive result is a test result indicating that the BAC exceeds the mid-point value; such a result is obtained when the test result indication exceeds the critical region.
- 2.5 Negative Result A negative result is a test result indicating that the BAC is less than the midpoint value; such a result is obtained when the test result indication is less than the critical region.
- 2.6 False Positive Result A false positive result is a test result indicating a BAC exceeding the mid-point value when the actual BAC is less than the mid-point value.
- 2.7 False Negative Result A false negative result is a test result indicating a BAC less than the mid-point value when the actual BAC exceeds the mid-point value.
- 2.8 Testing Time Testing time is the elapsed time from the initiation of a routine breath alcohol screening test until the result is obtained.
- 2.9 Manufacturer The manufacturer is the actual producer of the device and his designated

agents.

3.0 REQUIREMENTS

This section covers basic and operating requirements for breath alcohol screening test devices for law enforcement purposes.

3.1 Accuracy and Precision

3.4.3 When vapors of known alcohol concentrations are analyzed within the range corresponding to BACs of 0.01% W/V to 0.20% W/V, the proportion of positive results occurring at BACs within the range shall be approximated by a cumulative normal distribution. (See Appendix I) The distribution shall be subject to the following constraints:

3.1.1 The proportion of false positive results occurring at BACs less than the lower bound of the critical region shall not exceed 0.05.

3.1.2 The proportion of false negative and uncertain results occurring at BACs exceeding the upper bound of the critical region shall not exceed 0.30.

3.1.3 It is recommended that the critical region, expressed in BAC units, should not exceed 0.03% W/V. Test devices with critical regions greater than 0.03% W/V shall have clearly indicated on them in BAC units the size of this region.

3.2 Specificity

A test on alcohol-free breath shall not yield a positive result. Endogenously produced substances capable of being present in the breath shall not yield or significantly contribute to positive results.

3.3 Safety

Test devices shall comply with generally recognized safety requirements.

3.4 Operating Requirements

3.4.1 Testing Time The testing time should be less than 10 minutes. The manufacturer's specification must state the testing time.

3.4.2 Readability The test device must be capable of being properly read at the levels of illumination commonly existing in police vehicles at night.

Operating Temperatures Test devices should meet the requirements of 3.1 and 3.2 when used at ambient temperatures ranging from 32° F to 100° F.

The manufacturer's specification must state the operating temperature range within which the test device meets the requirements of 3.1 and 3.2.

Barometric Pressure Test devices should meet the requirements of 3.1 and 3.2 irrespective of atmospheric pressure. Alternatively, the manufacturer shall either specify the range of atmospheric pressures within which the requirements of 3.1 and 3.2 are met or provide suitable pressure correction data.

Cycling Temperatures The manufacturer's specifications must state the temperature extremes through which the test device may be cycled in accordance with the procedure described in Subsection 4.1 of the report without affecting its usability.

3.4.6 Shelf Life Where applicable, the manufacturer must supply an expiration date beyond which the requirements of 3.1 and 3.2 may not be satisfied.

3.4.7 Durability Test devices should be capable of withstanding the conditions associated with transportation in police vehicles during normal field use.

3.4.8 Simplicity of Operation Operation of the test device must be simple enough to require not more than four hours of formal instruction for operators.

4.0 COMPLIANCE TEST PROCEDURES

This section specifies the various procedures to which the test device(s) must be subjected in order to ascertain compliance with the requirements of Section 3.

4.1 Temperature and Humidity Testing

All test devices used in conducting tests 4.2, 4.3, and 4.4 shall be subjected to the following temperature and humidity testing:

The temperature extremes shall be those temperatures specified by the manufacturer as required in subsection 3.4.5, or -30° F to +120° F if the manufacturer's range exceeds these limits. The relative humidity must be maintained at not less than 90% throughout this testing.

4.1.2 The test device(s) shall be cycled twice, each temperature extreme being maintained for 24 hours.

4.2. Testing with Vapors of Known Alcohol Concentration A minimum of 40 consecutive tests shall be performed using vapors of known alcohol concentrations within each of the following

ranges:

4.2.1 A range of known alcohol vapor concentrations within -0.01% W/V of the lower bound of the critical region. For test devices with a critical region of 0.03, the proportion of tests in this range producing false positive results shall not exceed 0.04 (0.05 - 0.01, see Attachment, Table 1). For test devices with critical regions other than 0.03, the proportion of false positive results shall not exceed the proportions calculated using the methods shown in Attachment 1.

4.2.2 A range of known alcohol vapor concentrations within + 0.01% of the upper bound of the critical region. For test devices with a critical region of 0.03, the proportion of tests in this range producing false negative and uncertain results shall not exceed 0.19 (0.30 - 0.11, see Appendix 1, Table 2). For test devices with critical regions other than 0.03, the proportion of false negative and uncertain results shall not exceed the proportions calculated using the methods shown in Appendix 1.

4.3 Human Testing A minimum of five human subjects should be tested. The subjects should be given alcohol doses sufficient to produce maximum BACs from 0.08% W/V to 0.15% W/V.

During the post-absorption stage, a minimum of five blood samples or five deep lung breath samples substantially alveolar in composition, should be taken at intervals of not less than thirty minutes from each subject for quantitative analysis. A screening test should be conducted on each subject immediately before and after each quantitative breath test or blood sample. Each subject would thus be subjected to a minimum of ten screening tests.

At least 80% of the quantitative analysis results must lie outside of the critical region.

4.3.1 The proportion of positive results shall not exceed 0.05 when the BACs, as determined from the quantitative analysis, are less than the lower bound of the critical region.

4.3.2 The proportion of negative and uncertain results shall not exceed 0.30 when the BACs, as determined from the quantitative analysis, exceed the upper bound of the critical region.

4.3.3 The proportion of positive results occurring at BACs, as determined from the quantitative analysis, shall be approximated by a cumulative normal distribution (see Attachment 1).

4.4 Specificity Testing A minimum of ten tests on alcohol-free breath shall not yield any positive results.

ATTACHMENT 1

STATISTICAL DESCRIPTION OF THE ACCURACY AND PRECISION REQUIREMENTS

EDITOR'S NOTE-

This report has been omitted because the only available text copy is scrambled with many omissions. The subject matter is currently available in texts and over the Internet. The entire report is of historical interest only because of the many changes since 1972 in road traffic, breath-alcohol analyzers, device model specifications, statute and case law, policies etc.

**RECOMMENDATIONS FOR THE
PREPARATION OF ALCOHOL REFERENCE SOLUTIONS FOR
CONTROL TESTS OF BREATH ALCOHOL TESTING
INSTRUMENTS**

**NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS**

1989

RECOMMENDATIONS FOR PREPARATION OF ALCOHOL REFERENCE SOLUTIONS FOR CONTROL TESTS OF BREATH ALCOHOL TESTING INSTRUMENTS BY MEANS OF ALCOHOLIC BREATH SIMULATORS⁷

DEFINITIONS OF TERMS:

1. Alcohol refers to ethanol (ethyl alcohol).

Alcohol concentration: the mass of ethanol contained in a unit volume, expressed as grams/210 liters if the specimen is air.

Alcohol reference solution (commonly referred to as simulator solution): a mixture of a known mass of ethanol and a known volume of water, the headspace above which will have a known ethanol concentration at a specified temperature.

Alcohol stock solution: a mixture of a known mass of ethanol and a known volume of water from which an aliquot may be taken and diluted to prepare an alcohol reference solution.

RECOMMENDATIONS:

The governmental agency responsible for the approval of breath alcohol testing instruments and methods of analysis should insure that alcohol reference solutions used to test breath alcohol instruments are properly prepared. Alcohol reference solutions should be prepared by, or commercially prepared reference solutions or stock solutions should be analyzed by, the approving agency. Commercially prepared alcohol reference solutions or stock solutions should be analyzed by the agency or the agency's designee in addition to any analysis performed by the manufacturer or the manufacturer's designee. Preparation of alcohol reference solutions or the analysis of commercially prepared solutions or stock solutions should be conducted by qualified persons using generally recognized analytical procedures and equipment.

The alcohol concentration of the reference solutions should be known and traceable back to a standard reference material, such as National Institute of Standards and Technology (NIST, formerly National Bureau of Standards) Standard Reference Materials (SRMs). The homogeneity and stability of the reference alcohol solution should be established.

**National Safety Council
Traffic Safety Division
Committee on Alcohol and Other Drugs
Subcommittee on Technology
October 25, 1989**

Alcohol reference solutions and alcohol stock solutions should be prepared from reagent grade ethanol. The hygroscopic properties and density of ethanol must be taken into account when determining the purity and quantity of ethanol to be used. Water used in the preparation of reference and stock solutions should be chemically pure and free of microorganisms.

The solutions should be so mixed that the final ethanol concentration is uniform and homogeneous. Homogeneity should be established by analytical measurement of the ethanol concentration of a sufficient number of the aliquots of the solution dispensed. It is recommended that the first and last aliquots dispensed and several of the intermediate aliquots, be analyzed. All aliquots should have ethanol concentrations within 2% of the target value.

The actual alcohol concentration of the final reference solution should be established experimentally by a suitable method of analysis, such as titration against a primary standard of potassium dichromate traceable to NIST SRM 136e, or by gas chromatography against ethanol standards traceable to NIST SRM 1828.8

The stability of reference solutions should be established by repeated analysis of the ethanol concentrations during typical storage conditions and actual use. The approving agency should establish the date beyond which the reference solutions should not be used ("Expiration Date"), and this should be reflected both on the label applied to each portion, and in the directions for use. Stability is enhanced if pure, microorganism-free reagents, equipment and conditions are used in the preparation of reference solutions, and if solutions are protected from temperature extremes and evaporation.

Many breath-alcohol testing programs purchase alcohol reference solutions. The quality assurance practices of the manufacturer do not replace the obligation of the approving agency (or qualified designee) independently to determine and verify the homogeneity, stability and accuracy of the ethanol concentration of reference solutions.

Some breath-alcohol testing programs provide or purchase measured portions of concentrated standard ethanol stock solutions (e.g. ampoules of stock solutions), to be diluted locally (or at point-of-use) to make reference solutions. Such solutions should be lot-checked to verify the concentration and volume and the ability reliably to produce a reference solution of the desired concentration when directions for dilution are followed. All prepared reference solutions should have ethanol concentrations within 2% of the target value. The processes of reference solution analysis and dilution and instrument calibration must be in the hands of qualified personnel who understand the importance of using the recommended equipment and following directions faithfully. The approving agency is responsible for verifying periodically the suitability of reference solutions and preparation procedures used in the field.

1996 EDITORS NOTE: NIST SRM 1828 has been discontinued and re- released as NIST SRM 1828a.

**SPECIAL REPORT
ON THE
BLOOD/BREATH CONVERSION FACTOR**

**NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS**

A FACTOR FOR THE CONVERSION OF THE RESULTS OF BREATH-ALCOHOL ANALYSIS TO BLOOD-ALCOHOL CONCENTRATIONS FOR LAW ENFORCEMENT PURPOSES

The use of deep lung breath as a medium for the indirect estimation of alcohol in blood is based upon the existence of a relationship between the alcohol concentrations in such breath and blood. As is the case with any biological measurement, this relationship is subject to a number of variables. For the most scientific purposes therefore the expression of this relationship must be stated as a range, average or other appropriate expression. For law enforcement purposes however, the conversion of a measured breath alcohol concentration to a derived blood-alcohol concentration is normally accomplished by the breath testing instrument which is, of necessity, calibrated with a single value. For these purposes, this value must be conservative and must be reasonably selected on the basis of available scientific evidence. For many years, an empirical conversion factor of 2100 has been used.

In 1930 Liljestrand and Linde reported that the same quantity of alcohol was present in one milliliter of cubital vein blood as in 2000 milliliters of alveolar air after distribution equilibrium was established. In the ensuing quarter century, other researchers reported similar findings. Although the averages for the relationship ranged from about 1100 to 2700 in different reports during this period, the majority were around 2000 to 2200. The rather good agreement of these averages is remarkable considering the complexities of the problem due to the actual or potential biological variables and the difficulties of the measurements with the then available techniques.

In 1953 the Committee on Tests for Intoxication (now the Committee on Alcohol and Drugs) of the National Safety Council issued a report - "Evaluating Chemical Tests for Intoxication" in the Appendix of which was included the statement *"Available information indicates that this alveolar air-blood ratio is approximately 1:2100..."* Subsequent to this report, correlation studies made in several countries with various types of breath testing equipment showed that this 2100 factor gives results that are satisfactory for law enforcement purposes.

The tendency towards low blood-alcohol estimates reported in many of these studies, suggested that the average for the blood-breath ratio may however be somewhat higher than 2100:1.

In 1972 an Ad Hoc Committee with international representation met at Indiana University Law School to review the scientific data. The committee concluded that:

"Available information indicates that 2.1 liters of expired alveolar air contain approximately the same quantity of alcohol as in 1 milliliter of blood. Continued use of this ratio in clinical and legal applications is warranted."

This statement was endorsed by the Executive Board of the National Safety Council's Committee on Alcohol and Drugs in 1972. The "Standard for Devices to Measure Breath Alcohol" issued in 1973 by the U.S. Department of Transportation also includes a conversion factor corresponding to about 2100.

In its continuing review of relevant scientific information, the Committee on Alcohol and Drugs has noted a number of recent reports pertinent to this conversion factor. These tend to confirm that the average for the relationship between blood-alcohol and breath-alcohol concentrations is somewhat higher than 2100:1 and probably closer to 2300:1. This difference is of minimal practical significance in law enforcement. The use of a factor based upon the average for the blood-breath alcohol relationship reported in these studies would result in blood-alcohol concentration estimates only slightly higher than the traditional factor. Bearing in mind the requirement of the administration of justice for conservative evidence, this committee concludes that the continued use of the 2100 factor for the conversion of breath-alcohol to blood-alcohol concentrations is warranted for law enforcement purposes.

It should be noted that if the results of breath tests are reported as breath-alcohol concentrations rather than blood-alcohol concentrations, there is no need for a conversion factor. During the past two decades, much of the research on the effects of alcohol on human behavior has used breath analysis; there is therefore no scientific reason for not reporting alcohol concentrations in terms of the concentration in breath when breath tests are used. Until such time as statutes provide for this (or do not preclude it by definitions based solely on blood), an appropriate conversion factor is required.

RECOMMENDATION OF THE SUBCOMMITTEE ON TECHNOLOGY

**DUPLICATE BREATH ALCOHOL
TESTING**

**NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS**

1986

RECOMMENDATION OF THE SUBCOMMITTEE ON TECHNOLOGY

DUPLICATE BREATH ALCOHOL TESTING

October 1986

At least two separate breath samples should be collected and analyzed individually in performing any quantitative evidential breath-alcohol analysis. The breath samples should be collected at intervals of not less than 2 nor more than 10 minutes, after an initial deprivation period of at least 15 minutes. Reported breath-alcohol analysis results shall be truncated to two decimal places; and all results obtained shall be reported. Consecutive breath-alcohol analysis results within 0.02 g/210 L. without regard to sign, shall be deemed to be in acceptable agreement.

POLICY STATEMENTS

OPERATIONAL STATEMENTS

POSITION STATEMENTS

**NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS**

ETC.

**RESOLUTION of
Committee on Alcohol and Drugs National Safety Council
Chicago, Illinois**

October 2, 1975

"Some issues have been raised in the California Supreme Court's decision in People v. Hitch and allied cases in which the court held that chemicals and ampoules used in breath test cases must be preserved for possible pre-trial examination and analysis by defendants should they so demand it.

"A review of the scientific merits of this position has been made. It is concluded that, at the present time, a scientifically valid procedure is not known to be available for the re-examination of a Breathalyzer ampoule, that has been used in the breath test for ethanol, in order to confirm the accuracy and reliability of the original breath analysis."

Passed unanimously by the Executive Board and passed unanimously by the Committee on Alcohol and Drugs at its meeting in Chicago, October 2, 1975.

NATIONAL SAFETY COUNCIL POLICY STATEMENT

UNIFORM LEGAL MINIMUM DRINKING AGE

The National Safety Council is vitally concerned with the abnormally high percent of traffic deaths and injuries of our young people under 21 that are related to alcohol -- and encourages the passage of appropriate legislation to reduce and prevent this highway tragedy.

Approved by Board Executive Committee, October 18, 1982. Approved by Board of Directors, October 19, 1982.

COMMITTEE ON ALCOHOL AND OTHER DRUGS
NATIONAL SAFETY COUNCIL

STATEMENT ON DRUGS AND DRIVING

In most states, it is unlawful to drive while impaired by drugs. The concentration of a drug in a blood specimen can be used as evidence of impairment.

Therefore, it is recommended that if analytical results are to be used as legal evidence, that:

- Both the analyst and the method of analysis be approved by the appropriate state agency.
- Interpretation of the results be made by knowledgeable qualified scientists.

Approved by Executive Board, Committee on Alcohol and Other Drugs, February 14, 1983.
Approved by full committee, February 15, 1983.

This is an operational statement of the Highway Traffic Safety Division of the National Safety Council.

NATIONAL SAFETY COUNCIL POLICY STATEMENT

SANCTIONS FOR DRIVERS CONVICTED OF ALCOHOL IMPAIRED DRIVING

In order to increase the effectiveness of legal sanctions for persons convicted of alcohol-impaired driving, the National Safety Council recommends that jurisdictions:

- Require license suspension or revocation for fixed periods for all convictions involving impaired driving and eliminate mandatory severe penalties such as jail sentences for first offenders of un-aggravated impaired driving. Assure that all convictions involving impaired driving can be identified on driving records.
- Adopt the procedures by which offenders are processed to assure swift and certain adjudication. In particular, consider use of an independent civil procedure to suspend or revoke licenses on an expedited basis.
- Not mandate alcohol treatment programs as a substitute for license suspension or revocation but in addition to these or other sanctions.

Approved by the Highway Traffic Safety Division, October 18, 1985

Approved by the National Safety Council Board of Directors, April 21, 1986

NATIONAL SAFETY COUNCIL POLICY STATEMENT

ENFORCEMENT OF LAWS AIMED AT ALCOHOL-IMPAIRED DRIVING

The National Safety Council urges jurisdictions to develop and evaluate new pilot police enforcement programs based on objective assessments of drivers' use of alcohol. Recommended programs could include one or more of the following:

- Require all drivers in nighttime moving violations and crashes to be tested for alcohol by a reliable breath screening device or chemical test.
- Use passive alcohol sensors (those cooperation of drivers) to screen all nighttime moving violations and crashes.
- Require all drivers with a positive indication of alcohol to submit to a more precise breath alcohol test.
- Use passive alcohol sensors to screen all drivers stopped at random roadside safety checks.

Any procedure used in roadside safety checks by law enforcement officers should be measured against the following considerations and priorities:

1. Enhancement of officer and motorist safety.
2. Avoidance of undue inconvenience to the public.
3. The deterrent effect created by the roadside safety check.
4. Compliance with laws and court established criteria.

Approved by the Highway Traffic Safety Division, October 18, 1985

Approved by the National Safety Council Board of Directors, April 21, 1986

NATIONAL SAFETY COUNCIL POLICY STATEMENT

IMMEDIATE AUTOMATIC DRIVER'S LICENSE SUSPENSION

The National Safety Council urges jurisdictions to enact legislation providing for the administrative suspension or revocation of driving privileges by the licensing agency following an arrest for driving under the influence of alcohol or other drugs (DUI) in cases where the driver either refuses to submit to chemical testing or fails such testing by exceeding the established illegal per se alcohol concentration. The jurisdiction should employ progressive driver's license penalties for repeated violations.

Approved by the Highway Traffic Safety Division, October 1987. Approved by the Governmental Relations Committee, October 1988. Approved by the Board of Directors, October 19, 1988.

NATIONAL SAFETY COUNCIL POLICY STATEMENT

IMPAIRMENT AT LOW ALCOHOL CONCENTRATIONS

Laboratory and epidemiological research indicates that the ability of many individuals is impaired for driving and driving-related tasks at alcohol concentrations² below 0.08, and that for some individuals, impairment does occur at alcohol concentrations below 0.05. Therefore, at alcohol concentrations below 0.05, no statutory presumption regarding the presence or absence of alcohol influence should be made.

Approved by the Committee on Alcohol and Other Drugs, October 1987. Approved by the Policies and Issues Committee, May 1988.

Approved by the HTSD Executive Committee, July 1988.

Approved by the Highway Traffic Safety Division, October 1988. Approved by the Board of Directors, May 5, 1989.

² Alcohol concentration means either grams of alcohol per 100 ml of blood or grams of alcohol per 210 liters of breath.

PRO CON STATEMENT

POLICY STATEMENT ON IMPAIRMENT AT LOW ALCOHOL CONCENTRATIONS

Over 30 laboratory studies have been conducted that show alcohol impairment in individuals below 0.05 alcohol concentration. All of these studies show that at least some individuals are significantly impaired in the performance of tasks believed relevant to driving ability at concentrations below 0.05. In particular, research involving split tasks - which replicate driving likely to be seen in heavy traffic - indicates impairment for many people at alcohol concentrations below 0.05 and for at least some individuals at concentrations as low as 0.02.

Recent reanalysis of the data from the Grand Rapids study as published by Borkenstein et. al. in 1964 has looked at some of the subgroups in the study. The following groups had increased crash risk at alcohol concentrations below 0.05:

2. drivers
3. Elderly drivers
4. Drivers in heavy traffic
- Very young Drivers that are infrequent drinkers

The research noted does not support the legal presumption that all individuals are not impaired at alcohol concentrations below 0.05.

Many states would have to delete the portion of the statute that states: an alcohol concentration below 0.05 is presumptive evidence that the individual is not under the influence of alcohol.

Resolution Regarding Impairment at Low Alcohol Concentrations

At its October 22, 1986 meeting, the Committee on Alcohol and Other Drugs reaffirmed its 1971 position that there is no individual, regardless of his previous experience with alcoholic beverage consumption, who is not impaired in his driving performance if his alcohol concentration is 0.083 or more. The Committee further affirms that many individuals show substantial impairment at much lower alcohol concentrations.

Evidence for such impairment can be found in both laboratory and epidemiological studies. Regarding the former, a list of over 30 laboratory studies is attached (Attachment 1), all of which show that at least some individuals are significantly impaired in the performance of tasks believed relevant to driving ability at concentrations below 0.05. In particular, research involving split tasks --which replicate driving likely to be seen in heavy traffic --indicates impairment for many people at alcohol concentrations below 0.05 and for at least some individuals at concentrations as low as 0.02.

Opinion based on epidemiological evidence about the alcohol concentration at which crash risk begins to rise has been influenced for many years by the original analysis of the Grand Rapids Study as published by Borkenstein et. al. in 1964 (Attachment 2, Reference 1). In that study no increase in crash risk was noted at concentrations below 0.05 and, in fact, drivers with concentrations around 0.03 were found on average to have a lower crash risk than did drivers with no alcohol at all. This apparent decrease in crash risk has become known as the "Grand Rapids Dip".

More recent re-analysis of the Grand Rapids data, in which it has been possible to focus on the effects of alcohol on specific driver subsets rather than looking only at all drivers grouped together, have led researchers to reach rather different conclusions. According to these studies both very young and elderly drivers have increased crash risk at concentrations below 0.05 (Attachment 2, References 2, 3) as do drivers in heavy traffic (Attachment 2, Reference 3), and drivers who are infrequent drinkers (Attachment 2, Reference 4).

The last of these three studies is of particular importance because it not only shows that infrequent drinkers have an increase in crash risk above the average for all groups from the most infrequent imbiber to those who consume alcohol at least daily have a progressive increase in crash risk from their own group baseline crash levels as their alcohol concentrations increase. These data appear in Attachment 2.

The Grand Rapids Dip, therefore, appears to be an artifact resulting from different mixes of infrequent, moderately frequent, and very frequent drinkers at various alcohol concentrations. (The fact that crash risk with no alcohol varies from well above average to well below average probably is a reflection of different age and sex distribution and other variables rather than being a reflection of usual drinking patterns per se.)

3 Alcohol concentration means either grams of alcohol per 100 ml of blood or grams of alcohol per 210 liters of breath.

The statutory pattern for many years, and the specific law of some states, has been that drivers with alcohol concentrations of 0.10 or higher shall be presumed to be under the influence of alcohol, that no presumption either way shall be made for drivers with concentrations from 0.05 up to 0.10, and that drivers with alcohol concentrations less than 0.05 shall be presumed not to be under the influence of alcohol.

In light of the research discussed above, the Committee believes that the legal presumption that all individuals are not impaired at concentrations less than 0.05 is inaccurate. We therefore take the position that at alcohol concentrations below 0.05, no legal presumption should be made regarding the influence of alcohol that will be applicable to all drivers.

Attachment 1

"ARTICLES WHICH HAVE REPORTED IMPAIRMENT DUE TO BAC LEVELS OF 0.04 OR LESS"

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**NATIONAL SAFETY COUNCIL
POLICY STATEMENT**

UNIFORM PER SE LAW

1989

The National Safety Council urges states to adopt a per se law in accordance with 11-902 of the national Uniform Vehicle Code at a blood alcohol concentration (BAC) of 0.08 or the illegal per se amount as recommended by the Committee on Alcohol and Other Drugs. Consistency in this law would be expected to bring about a more uniform handling of driving under the influence (DUI) cases and the impaired driver problem throughout our nation.

Approved by the Traffic Law Enforcement and Adjudication Committee, June 1989. Approved by the HTSD Executive Committee, August 23, 1989.

**NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS**

POLICY RECOMMENDATION

WORKPLACE DRUG TESTING

1989

The National Safety Council has reviewed the policies and procedures set forth by the Department of Health and Human Services in the mandatory guidelines for Federal Workplace Drug Testing Programs; Final Guidelines (53 Federal Register 11979-11989, 11 April 1988) and recommends that these guidelines be considered by employers concerned with maintaining a drug free workplace.

**COMMITTEE ON ALCOHOL AND OTHER DRUGS
NATIONAL SAFETY COUNCIL
POSITION STATEMENT**

**DRUG EVALUATION AND CLASSIFICATION PROGRAM
1994**

Numerous state and federal studies indicate the drugged driver in causing injury and fatal accidents.

The National Safety Council's Committee on Alcohol and Other Drugs recognizes the Drug Evaluation and Classification Program (DEC) as developed by the National Highway Traffic Safety Administration (NHTSA) is a useful tool in reducing drug impaired driving in the United States. The DEC Program is based on the use of three disciplines: The toxicologist who provides the scientific confirmatory analysis and objective interpretation; the drug recognition technician, usually a law enforcement officer, who documents evidence of impairment; and the prosecuting attorney who presents the case to the court.

This combination is essential and when coupled with state support and coordination, can successfully impact the drugged driver problem.

Approved by the Committee on Alcohol and other Drugs, October 23, 1994.

This is an operational statement of only the Committee on Alcohol and Other Drugs of the National Safety Council.

**NATIONAL SAFETY COUNCIL
COMMITTEE ON ALCOHOL AND OTHER DRUGS**

POSITION STATEMENT

BREATH ALCOHOL IGNITION INTERLOCK DEVICES

1995

The use of a properly operating breath alcohol ignition interlock device appears to offer a useful countermeasure to reduce recidivism of a convicted alcohol driving offender. The following conditions must be met:

- The use of a breath alcohol ignition interlock device must not be utilized in lieu of a driver license suspension or revocation period and other traditional sanctions.
- The interlock system must undergo periodic inspections that assure the court of the integrity of the equipment and compliance with the court order.

Approved by the Committee on Alcohol and Other Drugs, November 5, 1995.

**PRO/CON STATEMENT
FOR
BREATH ALCOHOL IGNITION INTERLOCK DEVICE POSITION
STATEMENT**

PROS:

National traffic safety organizations such as the National Commission Against Drunk Driving, the Transportation Research Council and the National Highway Safety Administration recommend ignition interlock devices as a method of reducing the incidence of drunken driving.

Field experience has demonstrated that ignition interlock devices are comparatively more effective than other sanctions in reducing recidivism by offenders who are chronic alcohol abusers.

Ignition interlock devices contain relatively effective safeguards against tampering by those offenders who attempt to circumvent the program.

The cost of installation and maintenance of the ignition interlock device is borne by the offender rather than by the taxpayer.

CONS:

There is a danger that jurisdictions will utilize ignition interlock devices as a substitute for, and not in tandem with, other proven drunken driving deterrents.

Poorly designed equipment and/or monitoring programs will negate the efficacy of ignition interlock devices. Jurisdictions must develop performance guidelines and test procedures to insure the integrity of the program.

The sanctioning authority must dedicate resources and incur administrative costs in responding to the monitoring checks reported by the ignition interlock service provider.

Ignition interlock technology for the detection and prevention of impaired driving involving drugs other than alcohol is not feasible at this time.

MISCELLANEOUS

ALCOHOL AND GENERAL SAFETY

Robert F. Borkenstein

HISTORICAL

In 1837, the river packet Ben Sherrod burned destroying her crew and scores of passengers. Evidence showed that the boat met this disaster while engaged in a drunken race with another riverboat. This was one of a series of such events. As a result, stringent regulations governing drinking alcohol by crews on both freight and passenger steamships followed.

The situation became of such public concern that by 1899 Rule. G, prohibiting drinking while on duty, was adopted by the American Railway Association. By the mid-1800's, railroad employee brotherhoods were adopting and enforcing their own rules restricting the use of alcohol among their members. By 1900 the Age of the Motorcar dawned.

Laws prohibiting the operation of motor vehicles while under the influence of alcohol evolved rather slowly. The lag was due in part to the slow development of the automobile as a means of mass transportation and also to the effects of national prohibition. However, by 1924, the Connecticut Motor Vehicle Commission concluded that -- for the protection of all, any person who consumes alcoholic beverages and then operates a motor vehicle must be considered drunk. For all purposes of police enforcement a broad principle is laid down that no person who has been drinking ought to be allowed to operate a car.

In an address before the British Society for the Study of Inebriation, Sir James Purves-Stewart stated the views of his society in the British Medical Journal of 1928:

“At what stage of alcoholic intoxication is a man to be considered as drunk? According to a legal dictionary, no statutory definition of drunkenness exists, and a man may be held drunk in connection with one offense when he would not be held drunk in connection with another. The degree of intoxication which would make an engine driver drunk if he were driving an express train would not legally make him drunk if he were driving a horse and wagon.”

In the United States, Henry Ford, the industrialist warned: "If the prohibition were repealed or changed, we'd have to shut down our plants. Everything in the United States is keyed up to a new pace. The speed at which we run our motorcars, operate our intricate machinery, and generally live would be impossible with liquor." (24)

These are but a few of the subjective opinions that were drawn from the experience of observing cause and effect between alcohol and accidents, in industry, on the highways, and as Ford put it, generally live. However, the fact that alcohol turned up so frequently in accidents of the day stimulated scientific curiosity.

The notion of a national organization to promote general safety emerged in 1912, but this emergence was not sudden. Conditions were right. America was in the throes of industrial and transportation expansion, injecting it into a position of world power. Machines, including those of engine-powered transportation, claimed many human lives. Steel mills were termed slaughterhouses. As railroads moved westward, it was assumed one person would be killed for every mile of railroad track laid. This acceptance of mortality pervaded other hazardous life activities, each with its unique demands. In 1912 the First Cooperative Safety Congress was held in Milwaukee. A resolution from this meeting led to the formation Of a National Council for Industrial Safety in 1912. This organization became the National Safety Council in 1914. However, its interest in traffic safety did not emerge until 1924. Financed by industrial and .insurance interests as well as membership fees this nongovernmental and nonprofit organization was dedicated to industrial, highway, home, recreational, and farm accident prevention. The pioneering work of the National Safety Council has been expanded by the creation of a number of federal and state programs such as OSHA and NHTSA during the past thirty years. Since the National Safety Council was organized in 1912, death rates from non intentional injuries are estimated to have declined from 82 to 35 per 100,000 population in the U.S. But this is still unacceptably high.

ACCIDENTS IN THE PLANT

The World Health Organization (WHO) was formed in 1948. In the January 1966 issue of World Health, it was stated that it is now internationally recognized that one of the major dangers of alcohol is that of accidents -- in industry, in the home, and on the road. It is extremely difficult to evaluate exactly the role played by alcohol in industrial accidents. A group of French researchers, however, carried out a four-year, program in six types of industrial enterprises with extremely interesting results. The industries ranged from steel plants through shipyards to light manufacturing plants and even included a group of offices. There were, incidentally, no recorded accidents during the test period among office workers. The results of the study were tabulated separately to show the accidents in two types of industry, classified by the general drinking pattern in each plant. In one plant the workers, as a whole, were considered heavy drinkers, in the other, light drinkers. All workers reporting to the medical department for an on-the-job accident were asked to submit to blood tests for alcohol. Practically all agreed. As a control, blood tests were also performed on an equivalent number of workers reporting for routine physical examinations without any accidents. The alcohol levels revealed by the blood tests for each sample of workers were grouped into four categories of BAC as follows:

- (1) insignificant
- (2) low
- (3) medium
- (4) high

In almost all cases, the accident victims showed a higher percentage of alcohol in their blood than did the control group. Such correlations tended to indicate that in an environment where heavy drinking is practiced by a majority of workers, alcohol can be considered as a factor in accidents all day long. On the other hand, even in plants where workers drink less heavily, they frequently do drink some alcohol with their meals. In such environments, alcohol becomes an important accident factor in the afternoon. In both cases, the results of the study can be taken as strong evidence that alcohol plays a considerable role among the causes of industrial accidents.

GEOMETRICAL PROGRESSION OF ACCIDENT DANGER

The relation between home accidents and alcohol had up to the 1970's attracted little serious study. There were, of course, occasional newspaper stories about inebriates who fell in the home or accidentally set fire to houses, but as far as we know there was no statistically valid work done on this subject. It was, however, the opinion of experts working in the field that there is a correlation between drinking habits and the fact of being at high risk in general.

The most striking manifestation of the correlation between alcohol and accidents is on the streets and highways. A comprehensive study of the problem was conducted almost sixty years ago in the Chicago area, but smaller surveys in different parts of the world seem to confirm the basic premises. In the so-called Evanston study, carried out under the supervision of the American Medical Association in the 1930's, police staked out a sector in which a sample of 1,750 drivers, were tested for alcohol concentration.. During the same period, tests were made for the 270 drivers hospitalized following accidents occurring in the same sector. The results of this survey were analyzed by R.L. Holcomb of the newly-formed Northwestern University Traffic Institute. He found that as soon as the concentration of alcohol in the blood surpassed .00%, the chances of having an accident increased not arithmetically but in geometrical progression. Holcomb's analysis suggests that if 1 is taken as the figure indicating the likelihood of having an accident for an alcohol-free driver, his chances rise to 3 when the blood-alcohol level reaches 0.10%, to 35 at 0.15%, and to 54 by the time it becomes 0.20%. Roughly speaking, each time the BAC rises 0.02% the accident risk is doubled according to the values assigned in 1938 when this study was reported by Holcomb in the Journal of the American Medical Association.

These findings are confirmed by a later study (published as the Grand Rapids Study by Indiana University, in 1964). According to this study, drivers with alcohol blood levels over 0.04% tend to have more single vehicle, more severe (in terms of injury and damage), and more expensive accidents than sober drivers.

Last year, a paper entitled, DRINKING BEHAVIOR IN RELATION TO CAUSE OF DEATH AMONG U.S. ADULTS, was published in the Journal of the American Association of Public Health. The authors were Guohua Li, Gordon S. Smith, and Susan P. Baker of the Injury Prevention Center, Johns Hopkins University School of Hygiene and Public Health, Baltimore, MD. Data for this study were from the 1986 National Mortality Followback Survey conducted by the National Center for Health Statistics. This survey was designed to collect information on characteristics of decedents that may have affected mortality but were not available on the death certificates. About 1% (18,733) of all adults aged 25 years or older who died in 1986 in the United States, excluding the state of Oregon, were included in this survey, which was based on a stratified random sampling strategy. Information on decedents was obtained by mail-questionnaire, telephone, or personal interview from the informants named on the death certificates.

Three questions from the survey were used for this analysis. First, a screening question was asked to separate drinkers from nondrinkers. "In their entire adult life, did they have at least 12 drinks of any kind of alcoholic beverage, such as beer, wine, or liquor⁹" On frequency of drinking: "On the average, during adult life, how often did they drink any alcoholic beverages, such as beer, wine, or liquor?" Finally, consumption per occasion: "On the days that they drank, how many drinks did they have on the average, per day?" These questions were especially designed to collect information about usual practice.

Alcohol involvement is common in many fatal injuries. This study examined drinking behavior in a nationally representative sample of U.S. adult decedents aged 25 through 64 years and its association with cause of death. Proxy-reported information from the 1986 National Mortality Followback Survey was used to profile the decedents' usual frequency and quantity of drinking. The association of drinking behavior with underlying cause of death was assessed while adjusting for demographic characteristics.

Of the decedents, 17% were daily drinkers, 22% usually consumed five drinks or more per occasion, and 27% were classified as heavier drinkers. Persons who died of injury drank more frequently and heavily than those who died of disease. The researchers concluded that

daily drinking, binge drinking, and heavier drinking were each associated with an increased likelihood of injury as the underlying cause of death. Persons who were young, male, Native American, or divorced or separated were more likely to drink frequently and heavily. I repeat, this study was not limited to motor vehicle fatalities.

The high involvement rate of alcohol use in fatal injuries is well documented. For example, blood alcohol has been found in about 40% to 60% of motor vehicle crash victims, 32% to 46% of homicide victims, 20% to 50% of suicides, 25% to 50% of drowning victims, and 40% to 64% of fire and burn fatalities. Although alcohol use is generally considered one of the most important risk factors for almost all injuries, the causal role of alcohol use in injuries, except in motor vehicle injuries, is largely unproven.

CONCLUSION

The current tendency to try to control trauma in various life activities other than in road traffic may have pitfalls in terms of human freedom and effectiveness. Even in street and highway safety there is much to be learned about the effects of alcohol on situational behavior of drivers and much more to be learned about the demands of other life activities. Let us move cautiously and vigorously to improve the common good. The people in this room share this responsibility.