

B U L L E T I N

N O. 8 6 5

August 21, 1986

COMMENTS AND TESTIMONY ON THE EPA PROPOSALS TO  
BAN AND PHASE OUT ASBESTOS USES

In early 1986, we advised the Membership on the EPA proposals to ban and phase out asbestos usage in the United States. Our BULLETIN NO. 856 of June 16, 1986 noted that the Institute had sent written comments to the EPA on these proposed rules, and was forwarded to the Membership with a copy of those comments.

Comments were due by June 29, 1986. Starting on July 15, 1986, the EPA held hearings on the proposals, and heard prepared statements from several sources - those supporting and those opposed to the ban.

The Institute is concerned primarily with comments as they impact asbestos in friction products. We are enclosing copies of the following:

- (1) General Motors written comments of June 29, 1986 (Numbered GM 6/29-1 to 6/29-17).
- (2) Rita Grisham of Nuturn Corporation, text of prepared statement at hearing on July 15, 1986 (Numbered Nuturn-1 to Nuturn-8).
- (3) General Motors Corporation, text of prepared statements at hearing on July 16, 1986 (Numbered GM 7/16-1 to 7/16-14).
- (4) Natural Resources Defense Council written comments of June 29, 1986 pertaining to friction materials (Numbered NRDC-1 to NRDC-4).

Copies of these comments and testimony are sent as a matter of information.

E. W. Drislane  
Executive Director

Distribution:  
Delegates and Alternates  
H.E.A. Committee



Environmental Activities Staff  
General Motors Corporation  
General Motors Technical Center  
30400 Mound Road  
Warren, Michigan 48090-9015

June 29, 1986

Document Control Officer (TS-790)  
Office of Toxic Substances  
Environmental Protection Agency  
Room E-201  
401 M Street SW.  
Washington, D.C. 20460

RE: DOCKET CONTROL NUMBER OPTS-62036A; FRL 2999-2

Gentlemen:

Attached is the General Motors Corporation's statement on the proposed amendments to 40 CFR Part 763 (Federal Register, Vol. 51, No. 19, January 29, 1986, pages 3738-3759). These proposed regulations would restrict the mining and importation of asbestos and prohibit the manufacturing and processing of asbestos-containing products.

General Motors has carefully evaluated the proposed regulation's effect on the automotive industry's current uses of asbestos and the EPA's analysis of the health effects of those uses of asbestos. Many motor vehicle brake systems rely on asbestos-containing friction materials to meet performance requirements of the National Highway Traffic Safety Administration [NHTSA] and customer expectations. The task of engineering systems that use non-asbestos friction materials is enormous. No effective substitute has yet been found for a sizable number of these systems.

General Motors believes that flaws in the health risk estimates have led to an overestimation of risk attributed to the use of asbestos friction materials. Consideration should also be given to the safety risks which would be created by the premature elimination of all asbestos friction materials from motor vehicles.

While General Motors continues to question the need for the EPA proposed phase-down of asbestos, GM believes that the selective ban of asbestos friction products after a period of 10 years is more practicable than any of the EPA proposals.

GM 6/29-1

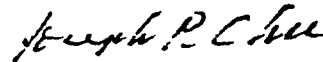
FMSI 02270

General Motors strongly urges the EPA to confer with the NHTSA to assure that changes in performance which may result from the forced use of non-asbestos materials are acceptable from a motor vehicle safety perspective. Failure to reconcile the potentially conflicting requirements of the two agencies would place vehicle manufacturers in an impossible position because they would be caught between different requirements of environmental and safety regulations.

General Motors also urges the EPA to reexamine the necessity of these proposed regulations in light of the newly amended regulations concerning occupational exposure to asbestos promulgated by the Occupational Safety and Health Administration. OSHA has determined that its new exposure standard will significantly reduce lifetime health risk from occupational exposure.

Thank you for the opportunity to comment on this issue. If you have further questions or wish to pursue any of the points in more detail, please contact me at (313) 575-8602.

Sincerely,



Joseph P. Chu  
Assistant Director  
Plant Environment

Att.

cc: Ms. Diane Steed, Administrator, NHTSA  
Mr. Barry Felrice, Associate Administrator, NHTSA  
Ms. Erika Jones, Chief Counsel, NHTSA  
NHTSA, Docket 85-06

GENERAL MOTORS CORPORATION  
STATEMENT ON  
ASBESTOS; PROPOSED MINING AND IMPORT RESTRICTIONS AND  
PROPOSED MANUFACTURING, IMPORTATION AND PROCESSING PROHIBITIONS  
(Docket OPTS-62036A, FRL2999-2)

June 29, 1986

INTRODUCTION

The EPA's proposed regulations would restrict the mining and importation of asbestos and prohibit the manufacturing and processing of asbestos-containing products. The EPA's proposal is to ban the use of asbestos in certain construction products and clothing immediately and to "phase-down" the use of asbestos in all other products. The phase-down involves a permit system in which persons who have mined or imported asbestos or asbestos-containing products in 1981-1983 will be granted permits to mine or import only 30% of the average amount of asbestos they mined or imported during 1981-1983 when this proposed rule becomes effective. The percentage will then be reduced by 3% per year.

General Motors [GM] is a manufacturer and user of asbestos friction materials and a user of other asbestos products. A careful evaluation of GM's current asbestos usages and particularly the usage in automotive brake systems, indicates that neither the EPA's proposed phase-down schedule nor any of the three EPA suggested alternative schedules are reasonable or practicable.

The EPA's basis for proposing such stringent regulations is questionable. GM believes that: 1) the EPA has not satisfactorily demonstrated, at least in automotive friction product applications, that the current patterns of asbestos usage present an unreasonable risk to human health; 2) the EPA has not adequately considered the availability of non-asbestos substitutes and the possible health risks associated with these substitutes; and 3) the EPA (even if it can establish a reasonable health risk basis for proposing regulations on asbestos phase-down) has not proposed a viable regulatory proposal.

The EPA is urged to confer with the National Highway Traffic Safety Administration [NHTSA] on this rulemaking to assure that changes in performance which might occur as a result of the forced use of non-asbestos friction materials is acceptable from a motor vehicle safety perspective. Failure to reconcile the potentially conflicting requirements of the two agencies would place vehicle manufacturers in an impossible position because they would be caught between different requirements of environmental and safety regulations.

The EPA should also reexamine the necessity of such stringent regulations in light of the new permissible exposure level [PEL] for asbestos that has been set by the Occupational Safety and Health Administration [OSHA] in Federal Register Vol. 51, No. 119, June 20, 1986. The new PEL, at 0.2 f/cc (fibers per cubic centimeters), is 10 times lower than the previous standard and OSHA believes that this new PEL will significantly reduce occupational risk.

Finally, General Motors has participated in the development of the comments which have been filed by the Motor Vehicle Manufacturers Association [MVMA]. Where consistent with this response, GM concurs with the MVMA comments and incorporates them herein by reference.

#### RISK TO HUMAN HEALTH

##### EPA's Finding of Unreasonable Risk

The EPA's finding of unreasonable risk is based on its estimates of the number of cancer cases that are identified as avoidable if the proposed rule is implemented. These estimates are the result of EPA's dose-response modeling of lung cancer and mesothelioma. GM believes that the EPA's model overestimates the risks and that a sufficient basis for banning all uses of asbestos, therefore, has not been established.

It should be recognized that the modeling of dose-response relationships between asbestos exposure and asbestos-related diseases is limited by the inherent deficiencies of epidemiological and animal studies. Dose-response data from epidemiological studies are often lacking, as in Selikoff's study (Selikoff et al., 1979) of insulation workers, because of a lack of asbestos air monitoring data.

Even if accurate dose-response data were available, the range of past exposures to asbestos as well as other hazardous substances experienced by study populations is typically much higher than current levels of exposure. Models that are developed on the basis of such data are potentially unreliable tools for estimating the effects of current exposure and must not be used until they are validated.

The dose-response model for lung cancer and mesothelioma chosen by the EPA is based on epidemiological studies on worker populations that have experienced exposures that are orders of magnitude higher than current levels. Although others have used models of similar structure, the validity of the models' assumptions is by no means noncontroversial. For example, it has

not been clearly established that the dose-response relationship for lung cancer is linear and has no threshold concentration. The validity of the method by which the values of the model's parameters (dose-response constants) were chosen is also questionable.

In the Appendix to Chapter 7 of the Report of The Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario (1984) [Ontario Report], Ronald J. Daniels and Robin S. Roberts noted that Selikoff's study does not contain any measurements of past exposure, and further commented that "the lack of accurate exposure data greatly detracts from the value of the study in providing proportionality constants for dose-response modelling."

In part of the same Appendix ("Predicting Workplace Health Risks"), Daniels and Roberts analyzed seven major epidemiological studies of asbestos workers (McDonald, 1971 & 1980; Enterline et al., 1973; Peto, 1977 & 1980; Dement et al., 1982; Berry and Newhouse, 1983; Finkelstein, 1983; Selikoff et al., 1979). They attempted to predict excess lung cancer risk from each study using a model that is structurally similar to the one chosen by the EPA (i.e. linear dose-response with no threshold.) The resulting predictions from these particular exposures to asbestos fibers differed by more than a factor of 100.

It appears that the EPA has not recognized that the predicted excess cancer risk for any given level of fiber exposure (e.g. 2 f/cc or 0.2 f/cc) is highly sensitive to the data from which a model is developed. It is interesting to note that in Daniels and Roberts' analysis of the excess cancer risk predicted from Selikoff et al.'s (1979) study of insulation workers was nearly 17 times greater than that predicted from Berry and Newhouse's (1983) study of factory workers producing friction products.

It is not suggested here that the EPA should combine risk estimates that are generated from the various studies to obtain an average value of excess cancer risk. Rather, it is suggested that the EPA recognize that the wide range of risks may be the result of measuring different risks. The Ontario Report as well as others have concluded that different risks are associated with different asbestos fiber types.

It has been recognized that prior exposures to chrysotile (the type of asbestos used in friction products) resulted in lower rates of asbestos-related diseases than exposures to crocidolite or amosite. This difference is generally believed to be attributable to differences between the fiber morphology and crystal structure among these three types of asbestos. Long, thin fibers are thought to pose the highest risk. Crocidolite and amosite are more biologically active than chrysotile. The Selikoff et al. (1979) study involved workers that were exposed to both chrysotile and amosite. The EPA's use of these data for

estimating future cancer risks that will almost exclusively be associated with low levels of exposure to chrysotile is inappropriate.

Since health hazard is strongly associated with the dimensions and airborne concentrations of fibers, it is also recognized that for a given type of asbestos fiber, the health risk is associated with the manner by which the fiber is released into the environment. It can therefore be inferred that the spraying of asbestos insulation is far more hazardous than the manufacturing of brake linings. This indeed has been shown to be the case. As noted above, Daniels and Roberts (1984) estimated that the excess cancer risk for insulation workers is nearly 17 times greater than that for factory workers making friction products. This raises serious doubt about the appropriateness of the EPA's use of data from a particular epidemiological study where exposure to mixed asbestos types occurred to predict cancer risks arising from all current and future manners of exposure, levels of exposure, and asbestos types.

The EPA's use of the data from Selikoff et al. (1979) for the development of their dose-response model for mesothelioma also appears to be inappropriate when, in fact, mesothelioma is more strongly associated with exposure to crocidolite and amosite rather than exposure to chrysotile. The EPA also claims that it has underestimated mortality because mortality from asbestosis and cancers other than lung cancer was not quantified. GM believes that this claim is unjustified. Clinical asbestosis among the general public has never been documented and the Ontario Report concluded that "asbestosis [among asbestos workers] can be deemed a disease of past high exposure levels and will not occur in workers exposed to the regulated levels of occupational exposure now in force in Ontario." Although it has been suggested that the inhalation of asbestos may cause gastrointestinal cancer and cancer of the larynx, an association between asbestos exposure and these diseases has not been firmly and consistently established in the literature.

GM believes that the EPA has overestimated the amount of asbestos exposure arising from brake maintenance and repair. The amount of chrysotile asbestos in brake dust samples have been measured to be less than 1% by weight (Williams and Muhlbaier, 1982). Potential exposure to asbestos during the servicing of automobiles has been regulated under OSHA 29 CFR 1910.1001 and will be even more closely regulated under the amended version. In addition, Appendix F of the new OSHA standard 29 CFR 1910.1001 suggests work practices which OSHA believes will prevent exposure levels from exceeding 0.1 f/cc.

The EPA has overestimated the risk arising from the use of asbestos friction products. As a result, the urgency of a total and expedited phase-down of asbestos in these uses is not warranted.

### Potential Health Risks of Nonasbestos Substitutes

While the EPA notes the apparent lower carcinogenicity of current non-asbestos substitutes, it seems to overlook the risk that may be present and the paucity of studies of some of the substitutes. This is a concern because of the apparent association of biological effects with certain physical characteristics of fibers such as morphology and durability. There is the potential that the use of substitute fibers, especially without controls, may cause exposures to fibers similar to those asbestos fibers which pose health risks. Total risk may be minimized only by regulations which reduce the amount of exposure to fibers of critical size, whether asbestos or other fibers. The EPA also should recognize that virtually all substitute materials require considerably more study to determine their health hazard potential.

GM, in its efforts to find suitable substitutes, has not overlooked its responsibility to determine the potential environmental and health impact of the use of such materials. Along with the development of its semi-metallic brake friction material as a replacement for asbestos friction material, GM has also conducted research to study potential adverse health effects. The results of our work indicate that the debris generated by the use of semi-metallic materials as brake linings constitutes no unusual health hazards beyond that of a nuisance dust.

As GM continues its efforts to find other suitable materials, parallel efforts are underway to assess potential risks. Among the new materials being tested are aramid fibers. Although there are currently no reports that there is a relationship between exposure to aramid fibers and adverse health effects in humans, inhalation toxicology data of Lee et al. (1983) and E.I. DuPont De Nemours & Co. (April 4, 1985 letter from Dr. Charles Reinhardt to Document Control Officer (WH-557), U.S. EPA) have indicated that the possibility of lung tumors from chronic, high level exposures in animals does exist. GM is continuing its evaluation of aramid fibers.

Because of the current lack of information on human health impacts of new substitute materials and the uncertainties with the extrapolation of available data to human exposure at lower fiber concentrations for longer periods of time, it is inappropriate to mandate a transition to such materials.

The concern that has been expressed here is really only one facet of a more generalized concern, the concern that risk not merely be transferred from one environment to another and that the net risk to public health and safety not be increased by the proposed regulations. While the intent of the EPA's proposal, undoubtedly, is to reduce net human health risks, it is not clear

8

that the EPA has given adequate consideration to the possibility that their proposal to reduce risks from asbestos may in fact have the unintended effect of substituting the risk of untested non-asbestos substitutes and lower motor vehicle safety for the asbestos risk.

The mere transference of risks at great expense and hardship is an unacceptable, though possible, consequence of the proposed regulations. More unacceptable, though equally possible, is that the net risk will be increased. Substitute materials and motor vehicle safety are only two of several possible areas to which the risks associated with the use of asbestos in vehicle applications may be transferred. To avoid such possibilities, GM urges the EPA to consider the benefits of the proposed regulations from a net risk perspective.

#### REGULATORY ACTION

If the EPA is insistent on a regulatory phase-down of asbestos under Section 6 of TSCA despite the questionable basis for such an action, then GM believes that the EPA must propose regulations that can be implemented in an orderly manner without unnecessary burden on the regulated community and affected public.

#### Cost-Effectiveness

Section 6 of TSCA requires that the regulations necessary for adequate protection against an unreasonable risk be the least burdensome. GM believes that the proposed Subpart H (Sections 763.140-763.159) as well as the EPA's proposed alternatives do not meet this requirement. The EPA's own Regulatory Impact Analysis of Controls on Asbestos and Asbestos Products (January 1986) [RIA] presented a more cost-effective alternative.

Six alternative regulatory strategies are analyzed in the RIA. The summary of the costs-benefits analysis for each alternative and the sensitivity of the analysis to the OSHA PEL for asbestos are presented in Table 8 and Table 13 of the RIA.

Alternative C of the six alternatives in the RIA would ban the use of asbestos only in the construction products category and in clothing. By eliminating a major portion of the asbestos market through this ban, the extent of asbestos mining, importation, and usage in other products will then be automatically curtailed by market forces.

According to the RIA, Alternative C, which was not presented in this notice of rulemaking, is the most cost-effective regardless of the OSHA PEL for asbestos. From the cost-benefit ratios in

9

Tables 8 and 13 of the RIA, Alternative C is three to five times more cost-effective, depending on the discount rate, than the EPA proposal (Alternative B) or any of EPA's three suggested alternatives (Alternatives D, E, and F).

The significance of differences in benefits achieved by Alternative C and the EPA proposal must be considered in light of the predictive accuracy of the EPA's model. These difference may not be real. Given the uncertainties in the data from which the model was derived and the assumptions in the selection of the model parameters, the variance of the model estimates, in all likelihood, overshadows differences of this magnitude. GM, therefore, believes that the EPA should find that Alternative C is the most cost-effective and will achieve the same level of benefits as its own proposal.

In addition to being the most cost-effective alternative, Alternative C would also avoid the administrative burdens associated with the proposed permit system. The establishment of an exemption system for applications in which non-asbestos substitutes cannot be found in time to meet the phase-down schedule would also be likely to be unnecessary.

#### Elimination of Asbestos from Friction Products

GM believes that the proposed ban of asbestos-containing friction products is unnecessary and that the phase-down schedules in the EPA's proposal and suggested alternatives are inappropriate. If banning of asbestos friction products is to be required, GM believes that a more practicable approach is for the EPA to pursue a program which would begin to ban the use of asbestos friction products in original equipment passenger cars and truck applications up to 23,000 pounds Gross Axle Weight Ratings (GAWR) after a 10 year period. In addition, there must not be any restrictions on the supply of asbestos (i.e. no permit system).

Even the EPA's own RIA showed that there is essentially no additional benefit to be gained from the phase-down of asbestos containing friction products or any other asbestos containing products beyond the construction products category and clothing category. If the EPA is insistent on banning of asbestos containing friction products despite the lack of a basis for such a ban, then the phase-down should at least follow a schedule which allows for the orderly discovery and validation of alternative materials.

Although GM has been active for many years in seeking substitutes for friction products, difficulties have been encountered which have prevented widespread substitution of asbestos. Factors that must be considered in selecting suitable substitutes have been detailed in GM's April 17, 1985 response to Docket OPTS-211015. The process of developing and approving substitute materials

includes assessing the ability of the material to meet durability, consumer acceptability, and federally mandated safety requirements. This process requires extensive research and testing programs.

The EPA has stated that effective substitutes are not available for many brake applications. GM agrees. GM further states that there is currently no known substitute material that can deliver the same brake system performance as asbestos for all applications even with modification to other components of the brake system.

The predominant non-asbestos brake friction material substitute being used by GM is of semi-metallic composition. These materials are now successfully used in nearly all disc brake applications on GM passenger cars and light duty trucks. It should be noted that the transition to semi-metallic linings was primarily motivated by the need to meet the stringent requirements of the Federal Motor Vehicle Safety Standard 105 [FMVSS 105], particularly the fade and recovery provisions for small, fuel efficient vehicles.

Some disc brake systems, however, still contain an asbestos underlayer that is used as a thermal barrier as well as an aid to attaching the lining to the metal backing plate. Development efforts are already underway to find a suitable non-asbestos underlayer material.

GM uses asbestos drum brake linings on nearly all of its vehicles. Designing systems to use non-asbestos drum brake linings is more difficult, as described in our April 17, 1985 comments. GM has used non-asbestos drum brake linings on two models and is developing them for additional applications. The NHTSA, however, has initiated an engineering analysis in one case and a defect investigation in the other. Action by the NHTSA may further complicate the search for non-asbestos linings.

Currently, in order to remove trade barriers, an effort is underway to harmonize the two existing dominant passenger car brake standards, the U.S. FMVSS 105 and the European ECE 13, into a single harmonized standard. As part of this effort, NHTSA has initiated rulemaking, and proposed a new FMVSS 135 as a U.S. proposal for the harmonized standard. The NHTSA proposal is more stringent than the two existing standards. More importantly, if enacted as a final rule, the proposed standard would have the effect of establishing more stringent constraints on the selection of brake lining materials. It would make the task of eliminating asbestos from brake systems more difficult, if not impossible, with currently available substitutes. To aid the EPA in understanding the complexities of brake system design and the contribution of lining materials to the performance of brake systems, General Motors comments to the proposed FMVSS 135 are included here as an attachment. General Motors believes that a

full consideration of this information by the EPA is of fundamental importance to this asbestos rulemaking.

Another obstacle to more rapid and widespread substitution for asbestos in brake linings is the enormous scope of the program that is necessary to address the large number of brake systems that are used in current vehicle applications. Each application (combination of vehicle type, weight, brake design, etc.) requires a different combination of material and physical components.

Over the next several years GM will be utilizing about 75 new passenger car and light duty truck brake systems. Approximately 15 systems will be used for medium and heavy (less than 23,000 lb. GAWR) trucks. For most drum brake systems, suitable non-asbestos compounds have not been identified. Once a suitable material is identified, another 18 to 36 months are used to validate (field test) the brake system to ensure that all performance requirements are met (e.g. FMVSS 105 or 121, durability, customer satisfaction, etc.). The total development cycle for any single brake system, including the identification of a suitable compound could require five years or more, depending upon the difficulties which are encountered. For these reasons, GM believes that a period of 10 years is a more practicable schedule for the selective elimination of asbestos friction products from most new vehicle applications.

For certain heavy truck applications (i.e. applications involving GAWR in excess of 23,000 lb. single/46,000 lb. tandem), there is currently no known substitute material that will meet performance requirements. Although GM does not manufacture brake linings for these applications, we have been working with our suppliers in developing the necessary technology, but progress has been very limited. Because of the difficulties to date and the need for "inventions" of a new material to meet these special, low volume applications, GM is unable to predict when asbestos can be eliminated. Disc brake systems have not been developed to replace existing drum systems for trucks in these heavy weight classifications.

#### Aftermarket Replacement Brake Linings

The EPA has requested comments on the issue of the aftermarket for asbestos brakes. As GM has stated previously, brake friction materials are only one element of design which establishes brake system performance. Simply replacing asbestos with current non-asbestos materials would inevitably alter the performance of brake systems.

While used brake systems which have been serviced are not required by regulation to meet the same detailed performance requirements as new systems, GM practice has been to provide

service components which substantially equal the performance of original equipment manufacturer (OEM) components. General Motors recommends the use of genuine GM replacement brake friction materials to assure acceptable performance after servicing. We believe that recent debates with the NHTSA regarding the performance of brakes on GM "X" cars and other vehicles have established that the characteristics of replacement materials should be substantially the same as OEM materials. While the EPA has correctly acknowledged that there are a multitude of replacement friction materials on the market, GM does not and cannot agree that these are fully acceptable as substitutes for its OEM materials as is suggested by merchandisers.

At the present time, General Motors markets brake system service kits containing asbestos friction materials for more than 100 brake applications. While the development of non-asbestos brake systems for original equipment is difficult, the development of non-asbestos friction materials for aftermarket use, particularly for systems which are no longer in production, can be expected to be even more difficult. It is GM practice to provide GM service kits with friction materials which are acceptable as direct replacements for OEM materials. Unfortunately, to General Motors knowledge no non-asbestos materials exist which would provide fully acceptable performance as direct replacements for OEM materials for many applications.

Alternately, such kits might be required to contain additional components, such as different wheel cylinders and/or proportioning valves, to compensate for any difference in the characteristics of the replacement friction materials. This alternative, however, is unlikely to be accepted in the replacement market. Customers often purchase non-OEM equivalent materials which may degrade the performance of the brake system. As important as all of these considerations are, the prospect of reengineering over 100 brake systems would be an enormous undertaking in and of itself. The challenge is made even more formidable in view of the fact that all available resources will be taxed to complete the similar task for OEM systems.

Vehicles that were designed to use friction materials containing asbestos clearly have finite lives and continued usage would naturally subside as these vehicles are retired from service. Rather than forcing GM and other OEM suppliers to consider discontinuing the practice of offering fully effective service kits, it is recommended that an exemption be provided so that vehicles having brake systems which were originally designed to use asbestos friction materials would be allowed to be serviced with asbestos. Such a strategy would also avoid the potential for undesirable changes in brake system performance.

### Exemption Process

The EPA has suggested the possibility of establishing an exemption process at the end of the phase-down period but did not give details of the procedure for obtaining exemptions. If the EPA proceeds with this rulemaking, then GM believes that an exemption process is essential and must be established concurrently with any phase-down or staged ban regulations.

Immediate exemption will be needed for aftermarket replacement brake linings. As discussed above, GM believes that requiring the conversion of aftermarket asbestos brake friction material to non-asbestos would be infeasible as well as ill-advised.

Immediate exemption will also be needed for asbestos replacement gaskets for certain aircraft engines. The Allison Gas Turbine Operations of GM is a manufacturer of aircraft engines and industrial engines. Most of the high temperature (over 700° F) gaskets used in these engines contain asbestos. The task of validating non-asbestos gaskets for engines that were originally designed to use asbestos is impractical and unwarranted in light of the de minimis health risk posed by this limited usage. As is the case for servicing past model vehicles, these aircraft engines will be retired at the end of their useful life, and the need for this exemption will disappear.

General Motors also believes that the exemption system must incorporate provisions for exempting brake systems for which no acceptable substitutes can be identified in time to meet the phase-down requirements for asbestos friction materials. While it can be expected that asbestos eventually can be eliminated from most brake applications, there is substantially less certainty that success will be realized for all passenger car and all truck applications (less than 23,000 lb. GAWR) within a 10 year period.

As mentioned earlier, there is currently no material available for converting to non-asbestos drum brake linings for certain heavy truck applications. Although GM is currently working with suppliers of brake systems who are pursuing solutions, the lack of viable candidate substitute materials makes it impossible to establish when a change can be implemented. As a result, GM urges the EPA to grant an exemption for trucks with GAWR's in excess of 23,000 pounds single and 46,000 pounds tandem so that the time which is essential to identify and validate substitutes is available.

Inasmuch as the details of an exemption system have not been proposed by the Agency, it is recommended that this matter be the subject of a supplementary notice of rulemaking so that interested parties will be afforded an opportunity to comment on and assist in its development.

### Labeling

The EPA has requested comments on whether the labeling of asbestos products that are not subject to immediate ban should be required. The following comments will be limited to the appropriateness of labeling asbestos products on motor vehicles.

GM believes that the proposed direct labeling of all asbestos-containing parts on motor vehicles would be burdensome and in most cases of limited or no value. The smallness of size and hostile environments (e.g. immersed in fluids, high temperatures) in which some parts must operate would make the direct labeling of such asbestos-containing parts ineffective because the label would be promptly lost, defaced or destroyed. Similarly the location of some parts would render the warning labels ineffective. GM currently labels all containers of asbestos friction material replacement parts with a warning label using the language suggested in 29 CFR 1910.1001.

If the EPA concludes that the subject of labeling of asbestos products should be pursued further, then GM recommends that the EPA issue a supplementary notice of rulemaking that contains specific details of the proposal and allow sufficient time for affected parties to evaluate the viability and impact of any such proposal.

### CONCLUSIONS

GM believes that there are serious questions about the necessity for the banning of all asbestos-containing brake friction materials. It is clear that the health risks associated with brake wear products is dramatically less than the risks estimated by the EPA. Given this, the health risk uncertainties associated with possible substitute materials, and the magnitude of the task of eliminating asbestos from brake applications, GM urges the Agency to reexamine its plans regarding this matter.

The questions of how and when all asbestos can be eliminated from all vehicle applications cannot be answered with any degree of certainty at this time. Substantial diversion of resources will be required to address the OEM passenger car and truck brake systems which currently employ asbestos. How long it will take to invent or identify, and to validate changes for all of these applications is subject to speculation. We also believe that it is impractical and unwise to pursue the elimination of asbestos from replacement friction materials for brake systems of past models which have been designed to use asbestos.

GM is certain, however, that the elimination of asbestos friction materials from OEM passenger cars, and OEM truck applications less than 23,000 pounds GAWR after a 10 year period is more practicable than the phase-down conditions of the EPA's proposal (permit system) or any of the EPA's suggested alternatives. GM is also certain that if a ban is to be required, immediate exemptions for heavy trucks (greater than 23,000 lb. GAWR), certain high temperature aircraft engine gaskets, and aftermarket brake linings will be required. The exemption system must also allow for the exemption of brake systems for which no acceptable substitutes can be identified in time to meet schedules for the elimination of asbestos friction materials. GM recommends that the EPA issue a supplemental notice of rulemaking that contains details of any proposed labeling requirements.

#### REFERENCES

Berry G. and Newhouse M.L., 1983 "Mortality of Workers Manufacturing Friction Materials Using Asbestos," British Journal of Industrial Medicine 40:1: 1-7.

Daniels R.J. and Roberts R.S., 1984 "Predicting Workplace Health Risks," in Appendix to Chapter 7 of Report of The Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario Toronto, Ontario, Ontario Ministry of the Attorney General, 1984.

Dement J.M. et al., 1982 "Estimates of Dose-Response for Respiratory Cancer Among Chrysotile Asbestos Textile Workers," Annals of Occupational Hygiene 26:1-4: 869-887.

McDonald J.C. et al., 1971 "Mortality in the Chrysotile Asbestos Mines and Mills of Quebec," Archives of Environmental Health 22: 677-686.

McDonald J.C. et al., 1980 "Dust Exposure and Mortality in Chrysotile Mining, 1910-75," British Journal of Industrial Medicine 37:11-24.

Enterline P.E., DeCoufle P., Henderson V.L., 1973 "Respiratory Cancer in Relation to Occupational Exposures Among Retired Asbestos Workers," British Journal of Industrial Medicine 30:1: 162-166.

Finkelstein M.M., 1983 "Mortality Among Employees of an Ontario Asbestos-Cement Factory," Toronto, Ontario Ministry of Labour, February 1983, revised September 1983.

Lee K.P., Kelly D.P., Kennedy G.L. Jr., 1983 "Pulmonary Response to Inhaled Kevlar Aramid Synthetic Fiber in Rats," Toxicology and Appl. Pharmacology, 71: 242-253.

Peto J., "Lung Cancer Mortality in Relation to Measured Dust Levels in an Asbestos Textile Factory," in Biological Effects of Mineral Fibres vol. 2 ed. J.C. Wagner, IARC Scientific Publications, no. 30, 1980, pp. 829-836.

Peto J. et al., 1977 "A Mortality Study Among Workers in an English Asbestos Factory," British Journal of Industrial Medicine 34: 169-173.

Selikoff I.J., Hammond E.C., Seidman H., 1979 "Mortality Experience of Insulation Workers in the United States and Canada, 1943-1976," Annals of the New York Academy of Sciences. 330: 91-116.

Williams R.L., Muhlbaier J.L., 1982 "Asbestos Brake Emissions,"  
Environmental Science Dept., General Motors Research  
Laboratories, Warren, MI.

TESTIMONY OF

RITA GRISHAM  
VICE PRESIDENT, HUMAN RESOURCES  
NUTURN CORPORATION

AT THE ENVIRONMENTAL PROTECTION  
AGENCY LEGISLATIVE HEARING ON ITS  
ASBESTOS BAN AND PHASEOUT PROPOSAL

July 15, 1986

I am Rita Grisham, Vice President of Human Resources, Nuturn Corporation, with headquarters in Nashville, Tennessee. I am in my thirteenth year of working with this friction manufacturer. Thanks for the opportunity to address the issue of asbestos use. Today I would like to do the following:

- Tell you a little about my company, Nuturn Corporation.
- Discuss our company's history and policy of dealing with asbestos.
- Discuss a few viewpoints on the EPA and OSHA regulations.
- Attempt to give you some insight on the critical issue of asbestos substitutes.
- And then make a few summary comments.

Nuturn Corporation is a basic manufacturer of a full range of friction materials, including disc brake pucks, drum lining segments, clutch facings for passenger cars and heavy duty vehicles, heavy duty brake lining (referred to as block) serving the tractor-trailer, school bus and transit markets as well as industrial and commercial flat sheets and

specialty products. We are primarily an aftermarket company but serve some segments of the original equipment market as well. We were formed in 1977 from a base of existing businesses dating back to friction material production in 1941. As a successor company (in many respects) for this prior business, my company maintains the personnel, health and medical records and we have never had a case of asbestosis -- certainly not of mesothelioma -- in the forty-five year history of this group of businesses which use chrysotile asbestos.

Nuturn, then, will address the proposed ban with a view that this is not the least burdensome alternative, nor is it necessary when one looks at responsible, controlled use of chrysotile asbestos.

First, I would like to discuss Nuturn's history in dealing with asbestos, which I feel will show that the risk from today's use of asbestos is not unreasonable in our manufacturing facilities. Since our beginning in 1977, we have enforced a 2.0 fiber/cc limit, have trained our employees and have labeled our products. We require respirators for all dry operations, such as bag opening and mixing regardless of fiber count. In 1982 we moved to a 1.0 (f/cc) limit, requiring face masks for any operation over 1.0 (f/cc) and referring to engineering as well to activate controls to reduce to that level. Only 5% of our monitoring reached 1.0 (f/cc) and required such referral. Then in December, 1983,

Nuturn-2

FMSI 02288

we adopted the ETS and never moved from it after court proceedings. We also placed a "no smoking" rule in place. So for 2½ years we have used masks for exposure to any fiber that exceeds 0.5 (f/cc) and instituted engineering controls to hold to that level. This will continue to be our policy for the substitute fibers, although we will have to move to 0.2 (f/cc) for asbestos operations, of course.

Next, I would like to discuss some of the "facts" related to the proposed EPA Ban, and some of the lack of logic in the new OSHA standard.

- A business such as ours must look at all health and safety issues -- not merely concentrate on one.
- Nuturn needs to be able to continue to have asbestos available as an ingredient -- especially in drum brakes, and in heavy duty brake block applications. We would like to be able to use this raw material under proper control, as we would aramid, ceramic, silica, quartz, copper, sulphur, graphite or other such substances. Let's allow business and industry to introduce safe and reliable products to the market as technology makes them available.
- Evaluation must be made of substitutes and proper handling techniques employed for all friction raw material components.
- For the multitude of friction product requirements, some successful alternatives have been developed. Not all applications have been successfully covered, however, forcing premature introduction of friction substitutes that could be irresponsible. My company has approximately 40 different formulas and some 80-90 ingredients. Substitutes for

Nuturn-3

FMSI 02289

asbestos do not occur on a one-to-one basis.

- EPA's statistics are inaccurate for the friction industry. In so far as exposure for brake mechanics is concerned, it is unfortunate (and I believe inaccurate) that EPA has assumed that exposure for mechanics constitutes the same risk as for insulation workers. There is no evidence to support this and I believe significant evidence exists that workers exposed to asbestos in friction product manufacture have little or no risk of lung cancer above that of workers in any industry today.
- The estimate of exposure of 600,000 persons, 250 days a year at 8 hours a day repairing and replacing brakes results (at 5 "jobs" per day) in 750,000,000 brake jobs per year. There are in fact only 30 million brake jobs per year so only 24,000 "full-time" workers would be "exposed." I won't attempt to speak to the inaccuracies this produces, but the fallacy should be evident.
- Additionally OSHA's new standard in Appendix F for Automotive Brake Repair Operations suggests three alternatives for maintaining counts below the action level, in fact at levels ranging from non-detectable to 0.07 (f/cc) using cylinder method, therefore, effectively protecting workers from any possibility of the already encapsulated fiber putting them at risk. Exposure estimates are therefore significantly overstated.
- Today's handling practices are adequate to remove excess risk without the need for a ban.
- Business today is able to control potential hazards that might be related to asbestos making the 40 C.F.R. Part 763 proposal unnecessary.
- The costs that business has to incur to meet the 0.2 (f/cc) OSHA standard would

Nuturn-4

FMSI 02290

not have been insurmountable had it not been for all the periphery requirements thrown in for hygiene facilities, regulated area demarcations, providing clothing for over 0.2 (f/cc) areas, and the new cartridge type respirator -- more costly and more uncomfortable. Just as we get to the point that we have met all the deadlines imposed by OSHA between now and July, 1987 at tremendous cost, are we then going to be told that they were unnecessary because we are going into a phaseout program? The mechanics of meeting the OSHA and EPA "economic double-whammy" could very successfully close many friction companies and drive the rest of them to the brink of financial disaster.

On the subject of substitutes, and regardless of regulatory initiatives, my company must look at all workplace hazards and has always viewed asbestos as one of many potentially harmful substances if not properly controlled. We cannot afford to act irresponsibly by concentrating on one type of fiber or dust issue and ignore all the others. Yet I get the feeling that in the interest of reacting to the asbestos issue EPA overlooks potential problems with substitutes. EPA refers continuously to aramid fibers (and in one instance -- p. 3747 -- refers to "low risk because they are basically nonrespirable"). This is absolutely in error. Aramid fibers of the same respirable dimensions and aspect ratios as asbestos are consistently shown on the filter following a monitoring exercise. The human eye coupled with phase contrast microscopy is unable to distinguish between the fiber type and merely counts it as an "asbestos" fiber.

Nuturn-5

Only after chemical analysis can it be determined if the fiber is asbestos or aramid. I therefore use a universal standard of 0.5 (f/cc) for all fiber exposures.

In friction especially -- EPA talks about aramid as a substitute. If we assume this is the stance taken, a company such as mine is faced with:

- 10 times the cost for material.
- Immeasurable processing cost differences -- in-depth technical studies, costly qualification testing, continual problems with mixing or processing -- and even performance variations that are difficult or impossible to analyze, to understand and to correct.
- Unidentified potential hazards with respirability of aramid. What is the "ban" potential for aramid? Do I learn how to use aramid only to have it, too, banned? Where does it stop?

Ceramic is frequently suggested as a substitute and producers have definitely warned that this product presents a "possible cancer hazard" and they recommend a 2 fiber/cc limit. Yet EPA apparently ignores this warning by suggesting ceramic as a viable substitute.

I find cause for concern with an EPA ban on asbestos that would force industry to move in the direction of substitutes that are more costly to us and therefore to the consumer (and at the same time may not be nearly so safe for the consumer in the case of brakes). Nuturn certainly supports reasonable work practices that are universally employed to protect workers and the public from dust and

fiber, whatever its source. We cannot fanatically deal with one material while ignoring the risks associated with others.

In summary, it is our position that:

- All potential hazards to workers and consumers should be considered and dealt with responsibly.
- A ban on asbestos is completely unnecessary. Not only are there minimal risks to the safe use of chrysotile asbestos, but industry is sorting out the substitution issue on its own -- by developing and using alternatives now, while science has the chance to sort out the potentially harmful effects of substitutes.
- While substitutes have been commercialized for many friction applications, there are not currently sufficient, safe substitutes for all applications of asbestos in the Friction industry.
- The proposed EPA ban, coupled with the new OSHA standard is irresponsible because it ignores the facts about asbestos and ignores the potentially harmful effects of substitutes.
- The proposed EPA ban, coupled with the new OSHA standard is an unwarranted burden on industry and the consumer, not to mention the inconsistent and illogical dichotomy in the EPA proposed ban coupled with more stringent OSHA standards.
- Finally, speaking for my company, we are a recognized leader in non-asbestos technology and have nothing to fear from a ban on asbestos. Nor, because of our own stringent workplace policies do we have anything to fear from tighter standards. Frankly, from a market standpoint, a ban and/or tighter regulations may be a boon to companies like Nuturn.

Nuturn-7

However, we feel compelled by a moral imperative to warn governmental agencies that they are succumbing to and creating an unwarranted hysteria regarding the use of asbestos in the Friction industry that will cost consumers billions of dollars.

We urge the EPA and OSHA to reconsider their positions and eliminate government direction and manipulation of technology in the market place.

6

**General Motors Corporation  
Statement on  
EPA Proposed Asbestos Mining and Import Restrictions and  
Manufacturing, Importation and Processing Prohibitions  
July 16, 1986**

**Opening Remarks at Public Hearing on Asbestos Ban by  
Joseph P. Chu, Ph.D., P.E.  
Assistant Director, Plant Environment  
General Motors Environmental Activities Staff**

My name is Joseph P. Chu. At the Plant Environment department of the GM Environmental Activities Staff, I am the Assistant Director responsible for coordination of GM's programs for compliance with TSCA requirements. General Motors has several serious concerns with EPA's proposed ban. Therefore, we are urging EPA not to adopt the proposed regulations.

General Motors is a manufacturer and user of asbestos friction materials and a user of other asbestos products. Our products which contain asbestos include brake systems, transmission systems, gaskets, adhesives, and sound deadeners.

We have submitted our comments and, today, three GM experts are with me. Each will be making a statement and then I will follow with our closing remarks.

The three GM experts, in the sequence of their statements, are:

Dr. William H. Krebs, Director of Toxic Materials Control Activity of the GM Industrial Relations Staff.

Mr. Robert L. LeFevre, Manager for Safety Standards and Security, Automotive Safety Engineering of the GM Environmental Activities Staff.

Mr. Thomas M. Johnson, Manager of the Brake and Bearing Systems Center, Current Product Engineering of the GM Current Engineering and Manufacturing Services Staff.

Now, may we begin with Dr. Krebs.

✓

General Motors Corporation  
Statement on  
EPA Proposed Asbestos Mining and Import Restrictions and  
Manufacturing, Importation and Processing Prohibitions  
July 16, 1986

Statement for Public Hearing on Asbestos Ban by  
William H. Krebs, Ph.D.  
Director, Toxic Materials Control Activity

I welcome the opportunity to comment on EPA's analysis of the health effects of asbestos as it relates to General Motors use of asbestos-containing friction materials.

The exposure of workers to excessive concentrations of airborne asbestos has long been recognized as an occupational hazard of industrial health significance. Where excessive exposures occur, it is generally recognized that inhalation of asbestos dust causes chronic inflammation of lung tissue and pleural membranes, as well as cancers. Ambient atmospheric levels of asbestos are not a recognized hazard to the public.

All types of asbestos are known to cause the inflammatory changes in the lungs and pleura and lung cancer. However, there is anecdotal, experimental and epidemiological evidence that there are differences in the potential of the different asbestos types to produce disease. Crocidolite is reported to have the greatest potential; amosite in between; and chrysotile being the least.

Of particular interest, and a reason behind the introduction of new regulations, is the relationship between the inhalation of asbestos and cancer, especially mesothelioma. The association between mesothelioma and asbestos first was demonstrated by Wagner et al in 1960. Mesotheliomas are rare, usually rapid, fatal cancers that originate from the surfaces lining the chest or abdominal cavity. From 1960 through 1975, 4,539 mesotheliomas were reported worldwide. Where asbestos exposures were involved, the vast majority of these cancers were in people exposed to crocidolite alone or in combination with other types of asbestos. Importantly, crocidolite, is not a component of brake lining materials.

Furthermore, not all mesotheliomas result from asbestos exposure. According to the American Conference of Governmental Industrial Hygienists, there is a background of spontaneously occurring mesotheliomas that has been estimated to be about ten (10) for males per million people and four (4) for females aged 45 years and older per million people. It is not uncommon for various epidemiologic studies to indicate that 15% or more of the reported mesothelioma cases have no history of ever having been exposed to asbestos.

Whether there is a dose response relationship associated with asbestos has been answered affirmatively by a number of epidemiologic studies. It is clear cut with regard to asbestosis and lung cancer. It is less well established with mesothelioma, but it is nonetheless positive. The existence of a threshold exposure level is not universally agreed upon. However, industrial hygienists, after careful study, have agreed that a threshold concept is consistent with their professional experiences and observations. As Dr. John Higginson once said, and I paraphrase, "For all intents and purposes, asbestos has a practical threshold when one takes into account its biological potency."

Of particular interest is the importance of the biological consequences of fiber morphology and size. Initially, a size limitation was placed on fibers being counted when using the National Institute for Occupational Safety and Health phase contrast method for asbestos. This was done because it was not practical to count shorter fibers with an optical microscope. It is recognized that for every fiber longer than 5 micrometers, there may be many more which are shorter that are not visible. However, there now is considerable experimental evidence to indicate that asbestos fibers shorter than 5 micrometers are not pathogenic. This has important environmental implications.

In the manufacture of friction materials, employee exposures are regulated by the Occupation Safety and Health Administration's Asbestos Standard. In the recent OSHA asbestos rulemaking, many of the studies relied upon by EPA for the ban and phaseout rule were also considered by OSHA. As you know, OSHA adopted practices that allow the controlled use of asbestos while EPA is proposing the material be banned. From the environmental viewpoint, the nature and extent of exposures to airborne levels of brake wear debris to which the public or employees may be exposed is not sufficient to result in disease. Furthermore, exposure to brake wear debris has not been shown by any reliable studies to cause any asbestos-related disease.

Brake linings contain approximately 50% asbestos by weight, all of which is chrysotile. Not only is chrysotile less hazardous than other asbestos types, but in friction materials chrysotile fibers are encapsulated in a solid resin matrix. During the braking process more than 99% of the asbestos fibers by weight in the brake lining mix are transformed into a non-asbestos material, reported by some to be forsterite. Furthermore, most brake wear debris is removed from the brake drum during vehicle operation. Industry studies confirmed by the EPA have shown that the brake debris which was present in the drums at the time of the brake service work contains less than 1% free asbestos by weight. Moreover, the asbestos fibers which were found in the brake wear debris are predominantly submicroscopic. As previously discussed, reliable studies have shown that, generally speaking, only longer asbestos fibers (greater than 5 micrometers in length) result in asbestos-related diseases.

Asbestos-related diseases are known to be dose-related. That is, there must be exposure to respirable asbestos fibers in excessive amounts for sufficient time before an adverse health effect will occur in some of the exposed personnel. There are well accepted exposure standards to which the results of air tests can be compared. These standards are used by the federal and state governments, and represent the concentrations to which employees can be repeatedly exposed, 8 hours per day, 5 days per week, year after year, without experiencing an adverse health effect. Studies of brake servicing operations have shown that the level of exposure to asbestos resulting from such work is well within the accepted exposure range.

My own industrial hygiene air studies conducted in dealership service garages have shown that asbestos exposure from brake wear debris was well below exposure limits in use at the time of the studies and well below exposure limits about to go into effect. The exposure to asbestos of mechanics who regularly perform brake work is of an intermittent nature. These findings have been verified by analysis of industrial hygiene studies conducted by NIOSH.

Brake relining operations were first identified as a possible source of potential excessive exposure to asbestos in reports published in the mid-1970's. Since that time, however, my own studies, as well as reliable reports appearing in literature, have shown that the studies on which the 1974 opinions were based are in error. Even though brakewear debris is known to contain a very minute percentage of asbestos fibers, no asbestos-related disease was found in studies in which animals were administered heavy doses of brake wear debris, and there is no study showing an excess of any asbestos-related disease among mechanics.

Substitute materials for asbestos have unknown toxicological properties. Given the long latency for the pneumoconiosis producing dusts, the introduction of new durable fibrous materials by producers gives the appearance they are "safer" than asbestos. Eventually that may prove to be true, but given the scientific evidence that is available today, General Motors believes that many of the durable fibers which EPA is suggesting be considered as replacement materials have not been studied sufficiently by their manufacturers to assess their safety or to draw comparisons with asbestos.

Suppliers have just begun to initiate experimental studies with a few of these materials. What appears to be occurring is a national movement from regulated to unregulated materials to avoid, among other things, the cost of compliance with workplace controls. This potentially could have tragic consequences. Given the fact that several asbestos substitute materials that were declared safe by EPA have later become the subject of Section 8(e) submissions, General Motors has adopted the following guideline. Until sufficient data are obtained, GM will continue using the environmental controls for asbestos when using substitute durable fibers.

In summary, exposure to asbestos received by the public and employees as a result of exposure to brake relining operations and normal braking operations, are minimal and far below the levels of exposure necessary to cause asbestos-related disease.

Because of the extremely low levels of submicroscopic asbestos present in brake wear debris and the intermittent nature of the exposure involved in brake relining aberrations, it is my opinion that asbestos brake lining and brake relining operations do not present a risk of adverse health consequences to those involved.

**General Motors Corporation  
Statement on  
EPA Proposed Asbestos Mining and Import Restrictions and  
Manufacturing, Importation and Processing Prohibitions  
July 16, 1986**

Statement for Public Hearing on Asbestos Ban by  
Robert L. LeFevre  
Manager, Automotive Safety Engineering  
General Motors Environmental Activities Staff

My comments today will address General Motors concerns regarding the potential impact of the proposed rulemaking on the safety of automotive brakes and the compliance of brake systems to safety regulations.

Assuring that vehicles are fitted with brake systems which fully meet the need for motor vehicle safety is a major responsibility of automotive engineers. Since 1968 the National Highway Traffic Safety Administration of the Department of Transportation has been active in establishing Federal Motor Vehicle Safety Standards which prescribe both design and performance specifications for brake systems on new vehicles.

At the present time standard FMVSS 105 regulates hydraulic brakes, and FMVSS 121 addresses air brake systems. In similar ways, brake systems for vehicles which are to be sold in other countries are subject to certain national or regional regulations. As General Motors detailed in its written comments on this asbestos rulemaking, efforts are also underway to reconcile the regulatory differences by developing an internationally harmonized brake standard.

Taken individually or collectively, these standards dictate compliance levels for a multitude of performance characteristic of brake systems and as a result have dominant influence on brake system design decisions. Despite this number of regulations, questions as to what constitutes fully acceptable safety performance for brake systems, continue to surface. General Motors and other manufacturers have repeatedly found themselves involved in discussions and debates with the NHTSA Office of Defects Investigations regarding the real-world adequacy of brake systems even though these systems fully conform with all regulatory requirements. In addition to the legal constraints, our customers have additional brake performance expectations in areas such as durability and noise.

Independent of all of the safety regulations, discussions about brake system performance and customer demands, the EPA has proposed to ban asbestos, one of the few materials which has the proven ability to function and survive in the hostile environment of brake systems. This action in essence calls for a forced change in the fundamental composition of most brake friction materials.

Inasmuch as there is no one-for-one substitute for asbestos, this change will require offsetting changes in brake system design. As General Motors advised in its written comments, some of its disc brake pads and virtually all of its drum brake linings are made with asbestos to achieve the essential blend of strength, friction stability and temperature capability. Some other materials have worked well in some applications; however, no effective substitute has been found for other applications.

The elimination of asbestos from the approximately 80 systems which currently use this material would be an enormous undertaking, and total success within the timeframes cited by the agency is not certain. In light of the difficulties which have been encountered in the past in finding materials which will yield system performance meeting all regulatory, safety and customer demands, we must urge the agency to proceed with caution along the lines which we have outlined in our written comments.

The composition of brake friction materials used for replacement purposes is also of serious concern to General Motors. As the EPA may be aware the performance of brake systems already operating on the public roads is not regulated, and federal regulations do not even acknowledge replacement brake friction materials. However, our experiences have taught us that replacement materials and systems which have been serviced must provide substantially the same performance as original equipment. If asbestos were to be banned as the agency has proposed and therefore were to be unavailable for use in replacements, it is probable that some applications would require that the sealed hydraulic systems be opened up to replace brake cylinders or other components to compensate for the different friction properties of the substitute materials.

For example, if the substitute materials had 10% lower friction, it might be that the best way to recover the lower system output would be by increasing the size of the wheel cylinders or to change operating pressure. We are convinced that customers would reject such costly part changes. To avoid causing significant changes in brake performance for cars designed to use asbestos friction materials, we urge the EPA to configure any asbestos rule so that it allows existing vehicles which are validated with asbestos linings to be serviced with asbestos linings. We believe that this strategy is consistent with the EPA's intent to curtail the use of asbestos, because these applications for asbestos will subside naturally as the vehicles are retired.

In summary, it is essential that the EPA collaborate with the NHTSA on this rulemaking to assure that any change in brake system performance which is made necessary by an EPA rule regarding asbestos usage is consistent with motor vehicle safety needs. It is important that both the content of any rule and any implementation schedule be responsive to both health and safety needs. Such a joint effort can assure that a potential conflict between NHTSA and EPA regulatory requirements will be avoided.

33

**General Motors Corporation**  
**Statement on**  
**EPA Proposed Asbestos Mining and Import Restrictions and**  
**Manufacturing, Importation and Processing Prohibitions**  
**July 16, 1986**

Statement for Public Hearing on Asbestos Ban by  
Thomas M. Johnson  
Manager, Brake & Bearing Systems Center  
General Motors Current Product Engineering

General Motors currently has in production approximately 80 unique brake systems. It sells replacement parts for many additional systems including more than 100 for vehicles produced since just 1982. In addition to federal laws governing brake systems, each system must provide vehicle owners with satisfactory performance for a wide array of conditions. A partial listing of customer requirements includes cold performance, hot performance, park brake effectiveness, noise, wear out life, friction stability, corrosion resistance, heat transfer rate, and fade resistance. These brake systems must satisfy customers ranging among the "old man of the mountain" who spends his retirement driving up and down pikes peak every day, rural mail carriers in Minnesota, New York city taxi cabs, and Mojave Desert park rangers. Though colorful to describe, these conditions represent actual brake tests for our vehicles. A more complete list is included in Attachment 1.

Each brake system is thoroughly tested to assure that these stringent requirements are met. This testing process involves hundreds of thousands of test miles on hundreds of vehicles. It involves years of fleet testing on public roads as well as scores of tests by Proving Ground testers. This testing is required to satisfy the safety and performance requirements of our customers. As a manufacturer, we provide this level of performance for both OEM and service brake parts for each of these approximately 200 brake systems. Because this process can require up to five years, an abrupt change of the linings on these brake systems can not be made.

As part of its normal product improvement process, GM completes this validation process on about ten new brake systems each year. This process requires about 100 engineers, technicians, and designers dedicated solely to brake system work. In addition, several hundred drivers and testers are required for the road testing of these vehicles. Fortunately, much of the test driving is done on vehicles which have many other parts being tested. However, redesign of vehicle brake systems already in production would require this testing to occur on many vehicles dedicated solely to brake system testing. Thus, if it takes 400 people to validate 10 brake systems per year, it would require an additional 1600 people for five years to redesign and validate 200 existing brake systems. Certainly some economy of scale would reduce this army, but you can see that the effort is formidable. Even neglecting the cost of such an effort, there are not enough trained people to handle an engineering and testing effort of this size.

We have attempted to produce an orderly phaseout of asbestos in the past. In 1979 the GM brake community made it a goal - to eliminate asbestos by 1985. This commitment has largely been met on front disk brakes but has not been met on rear drum brakes. The difficulties in changing the rears have been varied and subtle. They include squeal, wear, and friction stability.

In order to completely eliminate asbestos in brake linings, manufacturers, customers and the NHTSA may have to accept some changes in brake performance. For example, if we convince our customers to accept frequent lining changes and periodic replacement of drums, we could probably use some of the non-asbestos European linings. There is a high probability, however, that the customer will tire of the squealing noise and replace his linings with some untested but quiet lining material.

The key point that needs to be made is that even though there are replacements for asbestos, there are no direct substitutes for asbestos. The distinction is that replacement of asbestos linings with non-asbestos linings requires redesign and revalidation of the complete brake system. There are simply no known materials which can be substituted for asbestos with no change in performance. For example, in Attachment II, I have included a list of system changes which might result from a lining change.

In short, the elimination of asbestos friction materials in passenger cars and trucks represents a formidable engineering challenge requiring not only innovation but also invention. As an engineer I can accept that challenge, but only if the timeframe to implement it is realistic, and the process allows a realistic allocation of resources.

26  
ATTACHMENT I

BRAKE TESTING CONDUCTED AT GENERAL MOTORS

Brake System Testing Required by Federal Law

"green" brakes  
driver only stopping distances  
fully laden stopping distances  
fade  
water recovery  
parking brake  
abuse  
failures

Brake System Testing Required by Customer Performance Expectations  
All of the above testing plus:

durability  
corrosion  
mountains  
noise  
hills  
fade  
vibration  
pulsation  
cold  
snow  
car wash  
hot  
mud intrusion  
brake balance  
stability  
modulation  
pedal feel  
pull  
braking in a turn  
wear  
service

.  
.  
.

## ATTACHMENT II

### EXAMPLE OF SYSTEM CHANGES THAT MIGHT OCCUR WITH A LINING CHANGE

Assume that a replacement lining has 20 percent less friction than the original:

A larger wheel cylinder would be specified to achieve the required torque output.

A larger wheel cylinder results in more fluid displacement and may require a master cylinder change to obtain the proper pedal travel.

Larger master cylinder may make pedal effort too high necessitating a booster change.

Testing of the vehicle may indicate insufficient park brake capability due to the reduced friction necessitating a park brake cable change.

Increased cable forces may result in park brake strut buckling during abuse tests, necessitating a foundation brake redesign.

General Motors Corporation  
Statement on  
EPA Proposed Asbestos Mining and Import Restrictions and  
Manufacturing, Importation and Processing Prohibitions  
July 16, 1986

Closing Remarks at Public Hearing on Asbestos Ban by  
Joseph P. Chu, Ph.D., P.E.  
Assistant Director, Plant Environment  
General Motors Environmental Activities Staff

In closing General Motors' statements, I would like to summarize briefly our comments and add some remarks of my own.

I personally believe that, depending upon exposure conditions, any substance may be hazardous and may pose an unacceptable risk to public health and the environment. For example, cyanide is an important industrial chemical which is safe when managed properly. However, when ingested by humans at certain doses, death will occur almost instantly. Similarly, even though water is essential for human survival, a person may die of drowning due to the lack of oxygen caused by an excess quantity of water. Consequently, we ought not propose to ban every substance which is capable of causing harm in order to attempt to create a risk-free society.

In addressing this set of proposed regulations under Section 6 of TSCA, General Motors agrees that asbestos can be hazardous under certain conditions and may pose risk when improperly managed. Therefore, we believe asbestos must be handled with due respect to prevent it from causing any unreasonable risk to public health and the environment.

General Motors objects to the proposed regulations because we do not believe the Administrator has a reasonable basis to conclude that the proposed regulations are necessary. It is important to note that Section 6 of TSCA states:

"If the Administrator finds that there is a reasonable basis to conclude that the manufacture, processing, distribution in commerce, use, or disposal of a chemical substance or mixture, or that any combination of such activities, presents or will present an unreasonable risk of injury to health or the environment, the Administrator shall by rule apply one or more of the following requirements to such substance or mixture to the extent necessary to protect adequately against such risk using the least burdensome requirements: ....."

We believe EPA did not provide a reasonable basis to conclude that all of the to-be-regulated activities presents an unreasonable risk of injury to health or the environment should the current conditions continue.

As a result of increasingly stringent federal regulations of asbestos for the past 15 years, worker exposure to asbestos has been significantly reduced. In addition, asbestos uses in the U.S. have decreased from about 770,000 tons per year for 1971 to about 240,000 tons per year for 1984. It is beyond doubt that fewer people are exposed to asbestos today and such exposures are at much lower levels than in the past.

The basic problem with this proposal is EPA's use of historical risk and injury information that is related to the consequences of uncontrolled, excessive exposures to friable asbestos. This information is of little relevance to the regulation of manufacturing and use of other types of products which produce minimal exposure.

The chrysotile we use is in a friable form only prior to being manufactured into our brake linings. Our manufacturing facilities are stringently controlled for worker protection and emission prevention. The final products contain chrysotile only in non-friable forms. The use, servicing, and final disposal of these products release virtually no friable chrysotile and pose no significant exposure problems.

Reading the statutory language that I quoted previously, General Motors' objection to the proposed regulations is also related to the permit requirements which are not in line with the statutorily mandated "least burdensome requirements."

Under the EPA proposed 10-year phase-down, the mining and importation permit program will last 10 years. This proposed program would affect GM as an importer. I will discuss the burdensome nature of the proposal, based on my experience with some existing EPA permit programs.

In the proposed asbestos ban regulations, Section 763.148 concerns "Issuance of Permits." It would result in the preparation of permit applications by miners and importers, as well as the review, approval, and tracking of permit applications and approvals by EPA. Similar with other permit programs, obviously there will be frequent phone calls and written communications among applicants, EPA, and their consultants and contractors. And there will be unnecessary actions caused by misunderstanding and confusion.

1 39

Other proposed permitting requirements, especially when viewed as a whole, are also burdensome, because they include appeals on EPA's decisions, transfer of permits, banking of permits, reporting requirements, enforcement of the permit program, and EPA inspections to verify permit requirements. Each of these requirements will impose burdensome paperwork and administrative efforts on the part of EPA and regulated parties.

We are also very concerned that the 70% reduction in the supply as required by the proposed regulation may not allow General Motors to provide chrysotile containing brake parts for OEM or servicing our customers' existing vehicles.

We believe EPA, in proposing this set of regulations, has incorrectly assumed that asbestos containing parts and non-asbestos containing parts are interchangeable regardless of the design of brake systems. We must point out that any automotive brake system can safely be used only with parts which were designed for it.

As we pointed out previously, General Motors has developed and put into use brake systems that do not use asbestos. Our development of new brake systems and new material applications continues. However, we cannot predict when we can invent and when new materials will be discovered or developed which will permit us to use non-asbestos parts in all of our brake systems. This is especially true for heavy duty trucks.

Therefore, considering the safety of our customers and the the general public, we are obligated to continue production of chrysotile containing parts for servicing vehicles requiring such parts throughout their useful life. In addition, as we have pointed out, the current health risk of asbestos in motor vehicle applications, contrary to EPA's estimate, is insignificant.

General Motors does not believe there is a need for the EPA proposed phaseout of asbestos. If the EPA acts, however, General Motors recommends that a ban on asbestos friction materials for motor vehicles not take effect until after a period of ten years; and, that the EPA permanently exempt aftermarket brake linings. The details of these and other General Motors recommendations have been previously submitted in our written comments.

This concludes our remarks. We would be pleased to answer any questions the panel might have.



*Natural Resources  
Defense Council*

122 East 42nd Street  
New York, New York 10168  
212 949-0049

Comments  
of the  
Natural Resources Defense Council  
on the  
Environmental Protection Agency's  
Proposed Asbestos Mining and Import Restrictions  
and Manufacturing, Importation and  
Processing Prohibitions

51 Federal Register 3738  
(January 29, 1986)

Prepared by  
Jacqueline M. Warren  
Senior Attorney

Assisted by  
Barry I. Castleman, Sc.D.  
Technical Consultant

June 29, 1986

**FMSI 02309**

100% Recycled Paper

Washington Office:  
1350 New York Ave., N.W.  
Washington, DC 20005

Western Office:  
25 Kearny Street  
San Francisco, CA 94108

NRDC-1  
New England Office:  
850 Boston Post Road  
Sudbury, MA 01776

Toxic Substances  
Information Line:  
1-800-452-6760

certification as acceptable. A brochure on a GSA-approved system by Clayton Associates is attached;<sup>60</sup> this type of unit is already being used by a number of governmental bodies and other organizations which maintain fleets of vehicles.<sup>61</sup> Control of worker exposure during vehicle servicing and filter change with the previously mentioned enclosed system by Clayton is complete, according to measurements reported by electron-microscopy.<sup>62</sup> As for employee training, it has become standard operating procedure for mechanics employed by the state governments of Maryland and New Jersey.<sup>63</sup>

NRDC believes that EPA has ample authority to impose such a licensing scheme under section 6(a)(5) of TSCA. That section provides that the Agency may issue requirements "prohibiting or otherwise regulating any manner or method of commercial use" of a toxic substance. While such a requirement would be addressed to workplace situations, other persons present in or near brake repair establishments would be protected against exposures resulting from improper handling of asbestos during removal and repair of brakes.

---

60 Att. V.

61 Governmental units using the Clayton enclosed brake repair system include the Ohio Department of Transportation, the Philadelphia Police Department, and the Maryland, New York, and New Hampshire National Guard. Personal communication with James Clayton, June 23, 1986.

62 Letter from Dr. Arthur Rohl, Mt. Sinai School of Medicine, to Clayton Associates, Inc., October 12, 1984, Att. VI.

63 Personal communication, Dr. Grace Ziem, June 23, 1986.

from asbestos-containing and possibly from asbestos-free brakes, along with the recent commercial development of enclosed systems for brake servicing, NRDC now believes that a two-phased approach, rather than an immediate ban is warranted. As a first step, the most serious hazards to brake mechanics can be controlled by mandating the use of enclosed systems, and by requiring that only mechanics trained in the use of enclosed systems be licensed to perform brake repairs. If this is done, the complete elimination of asbestos in such products can be deferred for a time while substitutes are developed and evaluated.

A brake repair facilities "licensing" approach, which has been suggested to EPA in this proceeding by consultant Dr. Grace Ziem,<sup>59</sup> would follow the example of laws governing abatement of asbestos in buildings, such as those which have been enacted in Maryland, New Jersey, and other states. The brake repair work would only be allowed in establishments certified by government authorities. Such establishments would have to provide certified acceptable training programs for employees and use certified acceptable control systems and work practices. As part of their training, workers would have to learn about the dangers of asbestos and the proper use of approved technology and procedures.

Several enclosed vacuum brake repair systems are now offered by various manufacturers, though all may not warrant government

---

59 Letter from Dr. Grace Ziem to Environmental Protection Agency, May 12, 1986.

unbroken tradition of litigation over U.S. occupational asbestos standards; and, as we have seen in the past, it is impossible to predict which provisions of the new standard will be upheld or when those which are upheld will take effect.

B. Licensing Brake Repair Facilities .

In the petition to EPA in 1984, NRDC requested a ban on the use of asbestos in brakes. The brake repair problem is created by the presence of asbestos-containing brakes in vehicles which are presently in use and will eventually require servicing. EPA has indicated that it will take another five years before sufficiently developed substitutes will enable the Agency to ban asbestos in brakes and other friction products.<sup>56</sup> Further complicating the issue is the report that aramid fibers, now used as one asbestos substitute in brakes, may cause lung cancer by inhalation in rats.<sup>57</sup> Finally, despite a request to the manufacturer, we have not yet seen data on the extent of aramid fiber survival or modification under the conditions of brake wear.<sup>58</sup>

Given the extent of the existing and foreseeable problems

---

55 Asbestos Information Association/North America, et al. v. Occupational Safety and Health Administration, et al., Civ. No. 86-4422 (filed June 17, 1986, 5th Cir.); Building and Construction Trades Dept., AFL-CIO v. William Brock, Civ. No. 86-1359, (filed June 17, 1986, D.C. Cir.).

56 Proposed Asbestos Ban, 51 Fed. Reg. at 3749.

57 Letter from Charles F. Reinhardt, DuPont, to Environmental Protection Agency, Docket WH-557, April 4, 1985.

58 Certified letter from B. Castleman to Robert Nelson, Nuturn Corp., April 26, 1985.