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# ANALYSIS OF SRS INDUSTRIAL FIRE RECORDS (U)

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Westinghouse Savannah River Company
Savannah River Laboratory
Aiken, SC 29808

SAFETY • RESPONSIBILITY • SECURITY
SRS
SAVANNAH RIVER SITE

PREPARED FOR THE U.S. DEPARTMENT OF ENERGY UNDER CONTRACT NO. DE-AC09-88SR18035

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*SARM*
**Safety Analysis and**
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by

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## Approvals

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| H.E. WINGO, TECHNICAL REVIEWER | 1/29/90 DATE |
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# ANALYSIS OF SRS INDUSTRIAL FIRE RECORDS

The Savannah River Site has many operating years of experience with various facilities. Fires have occurred throughout the years at many of these facilities, but in general with only minor consequences. There has never been a fire related loss of life or serious injury on site [1]. The maximum dollar loss for a single fire was approximately $400,000 involving a coal and oil fire in D area. The following is a synopsis of data included in the fire division Industrial Fire records from January of 1958 until November of 1989. It includes fires from all areas on site which were attended by or reported to the fire division. The fires are characterized by number of occurrences, site areas and buildings in which they occurred, dollar losses sustained, the cause of the fire, and what type of suppression method was used to extinguish the fire. The reactor areas are included in all discussions of site wide fires, but are also singled out and analyzed separately due to perceived significance of fires there. Discussion of the completeness of the Industrial Fire data base is also included.

## 1. SITE-WIDE FIRE OCCURRENCES

Figure 1 shows the number of fire occurrences on the SRS by year. This Figure includes all fires in the Industrial Fire records from January of 1958 until November of 1989 including fires which occurred in vehicles, grass fires, railroad tie fires, etc. A more appropriate description of fire occurrences which might impact capital property or employees is fires which have occurred inside structures. Figure 2 shows the number of fire occurrences on the SRS by year which have occurred inside buildings. Also included in this graph are a few large transformer fires which can be considered separate buildings.

Comparing Figures 1 and 2, we see that excluding outside fires from the data does not affect the trends in the data perceptibly. Fire occurrence reports decreased greatly from 1958 through 1974, and then rose gently from 1974 to 1989 to a level approximately half of the 1958 reporting frequency. It is not clear what the cause of these trends is. It is not safe to say that the trends reflect an actual decrease and then increase in fire occurrences without considering that a change in reporting practices over the years may have occurred. See Section 2 for a discussion of the causes of SRS fires over the years.

Figure 3 breaks down the structure fire data into fires by individual areas on the site. As can be seen from this figure, areas A, F, M, and D contribute the majority of the building fires with area H following closely. Note that relative fire occurrence rates cannot be inferred directly from this figure since different areas have operated for different lengths of time around the site.

Figure 4 describes the causes of structure fires over the site. The cause and suppression code definitions used in Figures 4 and 5 are listed in Table 1. Figure 4 shows that maintenance activities such as welding, cutting, machining, etc. are the primary ignition mechanisms for fires at the SRS. Other primary contributors are oil or other materials coming into contact with hot surfaces, electrical shorts, and electrical and mechanical overheating.

Figure 5 describes the type of suppression activity which was used to extinguish the structure fires. Significant is the fact that only 136 out of 669 building fires (20%) utilized fire department services to extinguish the fire (note that this does not mean that the fire department only responded 136 times — just that the fires were often out when they got there.) The major mode of suppression was a fire extinguisher (34%) and then other types of local, non-fire department suppression (water, sand, smothering) (31%).

Dollar losses from fires on site have been relatively modest. Figures 6 — 9 show histograms of losses for fires in which a non-zero loss was reported in the fire records. As can be seen from Figure 9, only 6 fires with greater than $100,000 in loss have been recorded. Figure 8 shows that only 8 others have losses greater that $10,000 and Figure 7 shows 17 fires with losses between $1000 and $10,000. Out of 669 structure fires, 470 reported a $0 loss.

## 2. SITE FIRE CAUSES

The cause codes shown in Table 1 were derived in order to break up the fire causes into useful divisions, while utilizing the Fire Record description of the fire as much as possible. Thus, for example, some electrical fires were described as shorts in the fire description and some were described as overheating, and

| CAUSE CODE | DESCRIPTION | SUPP. CODE | DESCRIPTION |
|---|---|---|---|
| 1 | ELECTRICAL SHORT | 1 | SELF EXTINGUISHED |
| 2 | ELECTRICAL OVERHEATING | 2 | FIRE EXTINGUISHER USED (NON-FIRE DEPARTMENT) |
| 3 | MECHANICAL OVERHEATING | 3 | OTHER LOCAL EXTINGUISHMENT (NON-FIRE DEPARTMENT) |
| 4 | OIL IN CONTACT WITH HOT OBJECT | 4 | FIRE DEPARTMENT INVOLVED IN EXTINGUISHING FIRE |
| 5 | OTHER MATERIAL IN CONTACT WITH HOT OBJECT | 5 | AUTOMATIC HALON SYSTEM |
| 6 | VEHICLE FIRE (ANY CAUSE) | 6 | UNKNOWN |
| 7 | WELDING | 7 | AUTOMATIC SPRINKLER |
| 8 | OIL SELF IGNITED (OVERHEATED) | | |
| 9 | CIGARETTE | | |
| 10 | OTHER MAINTAINANCE / GRINDING, CUTTING, ETC. | | |
| 11 | COOKING | | |
| 12 | SPONTANEOUS IGNITION | | |
| 13 | SUN CAUSED | | |
| 14 | UNKNOWN | | |
| 15 | LIGHTNING | | |
| 16 | CHEMICAL REACTION | | |
| 17 | FLAMMABLE GAS | | |

Table 1. Cause and suppression codes used and corresponding descriptions

therefore two categories for electrically caused fires were used. If only fires where electrical equipment was involved in some manner are of interest, categories 1 and 2 could easily be added together. Note also that in some cases, the fire description indicated that electrical equipment was involved in starting the fire, but how it was involved was not stated. In these cases, judgement was used to place the fire in one of the categories. This also goes for some of the other categories, since in cases where the fire description was vague, but contained some pertinent information, judgement had to be used to place the fire in an appropriate category. This fact means that the relative numbers of fires between categories may be taken as indicative of fire causes on site, but absolute accurate numbers should not be implied. In the majority of cases, however, the fire description was complete enough to adequately characterize the fire.

Examining Figure 4 again, we may break the fire causes up into two rough categories: random fires which may occur at almost any time, and those fires which may be expected to occur at defined times and/or when people are present. These two divisions are not necessarily mutually exclusive, but will serve to give an indication of where passive changes in practices might be expected to impact the site fire occurrence rates.

Random fires occur, for the most part, due to equipment faults or other natural phenomena which do not have a direct human cause. The cause codes 1—5, 8, 12, 15, and sometimes 16 and 17 (as described in Table 1) might be attributed to random equipment faults or other natural phenomena. These encompass electrical faults, mechanical faults, chemical reactions, lightning, etc. Out of the 605 fires in Figure 4 where the cause is known (i.e., excluding code 14), these categories comprise 381 of the 605 fires or 63 percent. To decrease the fire occurrence rates from these types of fires, more reliable equipment could be used, better maintenance could be used, better housekeeping could be achieved, etc. However, these types of fires would still occur since no equipment is perfect.

The potential for greatly reducing or at least limiting the extent of fires due to direct human causes, however, is possible with increased vigilance during fire prone operations such as welding. Improved housekeeping during maintenance, fire watches during the operations, etc. could be effective in these types of situations. The cause categories 7, 9, 10, 11, and sometimes 16 and 17 could be classified as this type of fire. Codes 16 and 17 will not be included here since they were included in the random fire occurrence totals above. The number of fires in the other four categories totals 224 out of the 605 fires where the cause is known (37 percent). Of these, 188 are welding or other maintenance related fires which fall directly under the human caused fire classification.

Examining the cause codes individually is instructive in attempting to assess whether the time trends in the occurrence data are real or not. The time trends indicated in Figures 1 and 2 could be caused by changes in the causes of fire over the years, or could be caused by changes in reporting practices. Figures 10—22 show the number of fires by year which were caused by each cause category that had a substantial number of fires.

Categories 1 and 2 (electrical shorts and overheating) show a basically steady rate of occurrence over the years, exactly what we would expect if electrical fires are random in nature and if reporting practices have been constant. Category 3 (mechanical overheating) also shows a basically stable rate. Code 4, however, (oil/hot object) shows the same basic time trend as the overall site data.

An analysis of the fires which were classified as code 4 shows the reason for this trend. Considering Figure 13, the major deviations from a constant code 4 fire occurrence rate are in the years 1960 through 1968. During this period, there were two sources of fires which stand out from all the rest: denitrator fires in F area and Powerhouse fires. Out of the 81 fires in Figure 13, 35 can be ascribed to denitrator fires. Another 15 are from powerhouse fires. Interestingly, 35 out of the 36 denitrator fires occurred between 1958 and 1970 with 31 of these occurring between 1960 and 1970. There has been only one other reported denitrator fire in the last nineteen years (in 1978). Out of the fifteen powerhouse fires, eleven occurred between 1960 and 1968. If we subtract these fires from the occurrence data, we find again an essentially constant fire occurrence rate for cause code four. This indicates either changed reporting practices from these two specific site areas or improved fire safety practices.

Cause codes five and six show slight early year biases, but nothing substantial. Cause codes 7 (welding) and 9 (cigarettes) show substantial early year biases. In the earlier plant years, it would be expected that more construction and modification work would be going on than in the relatively stable (until recently) period since. Thus, we would expect an increase in fires in the early years. The code 9 fires (cigarette caused) might indicate either a drop in the number of smokers or a decrease in tolerance to unrestricted smoking or both. In any case, cigarette fires are not a major cause.

Cause code 10 (other maintenance, etc.) shows the same trends as welding, and this trend could be explained in the same fashion. Cause codes 12 (spontaneous combustion), 14 (unknown), 16 (chemical reaction) and 17 (flammable gas) all show a slight early bias, but again, nothing substantial. An interesting note is the cessation of flammable gas fires around 1982 (Figure 22). Many of the code 17 fires were $H_2S$ fires in the heavy water production area. Since this activity no longer occurs, the fire data accurately indicate the end of fires due to the process.

The above discussion does not prove that the site data time trends are not caused by changes in reporting practices, but since the most time-biased cause of fires (code 4) was shown to be caused by fires in specific areas and not by changes in site-wide reporting practices, it would be a reasonable assumption to make that the decrease in observed fire occurrences is a real trend. This would also be consistent with the increase in fire safety awareness which has occurred in many aspects of building design, operation, etc. during the 1970's and 1980's.

## 3. LARGE LOSS FIRES

As mentioned above and shown in Figure 9, there have only been six "large loss" fires on the SRS since 1958. Appendix A presents the Industrial Fire database records for these fires, listing their dates, locations, descriptions, cause and suppression codes, and unadjusted dollar losses. Of these six fires, four were caused by electrical equipment, one was in a powerplant precipitator involving coal and oil (the largest loss) and one involved an $H_2S$ gas fire in D area. Three of these fires occurred between 1960 and 1980 (one electrical and the other two nonelectrical) while the other three electrically related fires have occurred since 1986. All of these fires were "randomly caused" as discussed in Section 2, and thus these types of fires may be expected to continue to occur. The only exception would be the 1960 $H_2S$ gas fire since heavy water is no longer produced onsite.

## 4. REACTOR AREA FIRE EXPERIENCE

A shown in Figure 23, the Reactor Area fires reported in the Fire Division Industrial Fire record show the same time trends as in the site wide fire data, but not to as extreme an extent. The maximum number of fires which were reported during a year in the reactor areas was eleven in 1960, with several years only reporting one fire.

Figure 24 gives a little more perspective to where the fires occurred between reactors. These raw numbers, however, are not representative of the actual fire rates since the reactors were run for differing periods of time. Table 2 shows the actual operating periods for each of the five reactors during the period 1958 — 1989. These operating periods are then transformed into relative fire frequencies for each area (Table 3). For our purposes, we define "operating" as being occupied and worked in — not just during the reactors' actual nuclear operation.

The results in Table 3 show that except for R reactor, the recorded fire frequencies for all of the other reactor areas are essentially the same. Also note that the fire occurrences used to derive these frequencies involve all sizes of fires: from insignificant smoldering trash barrels to large transformer fires. Thus, the frequencies derived are the frequencies of <u>any</u> fire occurrence (within the accuracy of the data base). The frequency of occurrence of large fires will be lower.

| REACTOR | 1958 | SHUTDOWN | STARTUP | PRESENT | OPERATING YEARS |
|---|---|---|---|---|---|
| R | 1/58 | 4/64 | — | — | 6.3 |
| P | 1/58 | — | — | 11/89 | 31.9 |
| L | 1/58 | ~2/68 | 10/85 | 11/89 | 14.2 |
| K | 1/58 | | | 11/89 | 31.9 |
| C | 1/58 | 6/85 | — | — | 27.4 |
| TOTAL | — | — | — | — | 111.7 |

Table 2. Operating years by reactor area

| REACTOR | # OF FIRES | OPERATING YEARS | FIRE FREQUENCY (PER YEAR) |
|---|---|---|---|
| R | 14 | 6.3 | 2.2 |
| P | 31 | 31.9 | 0.97 |
| L | 11 | 14.2 | 0.78 |
| K | 23 | 31.9 | 0.72 |
| C | 20 | 27.4 | 0.73 |
| TOTAL | 99 | 111.7 | 0.89 |

Table 3. Fire occurrence frequencies by reactor area

Figure 25 shows a breakdown of the buildings in which fires have occurred in the reactor areas. As can be seen, the majority of fires have occurred in the reactor (105) buildings and in the powerhouses (184 buildings). In fact, the 105 buildings involve almost half of the recorded fires for a fire frequency of approximately 0.42 per year (again, this frequency considers all recorded fires; both small and large).

Figures 26 — 28 describe the fires which have occurred in 105 buildings. Figure 13 shows where in the building the fires occurred. As can be seen, a large proportion of the fires occurred on the ground floor level of the building. There were also several purification area fires (-15), lunch room/bathroom fires (+15), and fan room fires (+48). Figure 27 shows the causes of these fires. Interesting here is that welding/maintenance fires (codes 7 and 10) account for 19/47 of the fires (40%). Smoking related fires accounted for 6/47 (13%). These fires are not uniformly spread around the building by cause, however. Of the eight fires which have occurred on the -40 level, one has an unknown cause, one is smoking related, and the other six are all welding/maintenance related. Of these -40 level fires, only one of them involved fire department response; the other seven were extinguished locally.

Figure 28 shows how the fires were suppressed in the 105 buildings. Of the 47 fires, 35 of them were extinguished locally or self extinguished. Nine of the 47 involved fire department response and three did not describe the mode of suppression. It could be inferred from this that a maximum of 12 of 47, and more probably 9 out of 47 fires were considered of sufficient magnitude to warrant calling the fire department. This would lead to a “large” fire frequency in the 105 buildings of 9/111.7 = 0.08 per year to 12/111.7 = 0.11 per year. This is not quite true since some of the fire department involved fires were described as quite small, however, some of the locally suppressed fires may have been larger than has been inferred from their descriptions.

Figure 29 describes the economic dollar losses which have been incurred from fires throughout the reactor areas. As can be seen, except for one large transformer fire (L area, containment substation transformer, described in Appendix A), losses have been quite minimal, the total recorded losses being well under $200,000 including the $150,000 transformer fire. These figures are in unadjusted dollars.

## 5. CONCLUSIONS

The Industrial Fire Record data used in the above analysis is not complete. Undoubtedly there are fires which occurred around the site, and for one reason or another were not reported. A more complete data base for the 200 areas which includes fire "events" which are not in the Fire Division Industrial Fire Records has been compiled.[2] No attempt has been made to include fires from this data bank in this analysis. It is believed that all the large loss fires on site are in the Fire Division Industrial Fire Records and that including other fires from Reference 2 would only add to the small fire frequency. At present, however, this belief is not supported by analysis. No similar data base which includes fire events exists for the 100 areas, and thus this data is the best available. Also, it is apparent from examining the records that the damages recorded in the Industrial Fire Records were recorded in a nonuniform manner over the years since many of the fires were listed as "damage unknown" and then some time later a number written in — often $0. From the descriptions given, something was damaged in many of these $0 fires, and thus the criteria for assessing the damage dollar loss is not clear.

Acknowledging these caveats, we may, however, be confident that the fire department would have been informed of most if not all significant fire occurrences around the site. Also, it can be expected that the dollar losses listed for major fires in the record are at least indicative of the actual sustained physical losses since much more attention would have been given to these fires. There is also no basis for assuming that a lack of reporting of fires to the fire department would have any area to area bias, and thus the numbers as reported should give accurate relative measurements between the various site areas of the number and types of fires which have historically occurred. The actual fire frequencies such as those derived in Table 3 for the reactor areas are believed to be reasonably accurate for non-trivial fire occurrences, and many trivial ones as well.

The data discussed for dollar losses sustained on site has not been adjusted for inflation. The relatively few large loss fires (six) which have occurred have also had relatively minor monetary impact. The largest dollar loss indicated ($400,000) is almost twice the next highest loss ($228,000), and even adjusting for inflation, the $400,000 would be at or under $1,000,000 and the other five would be well under $1M.

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[1]Private communication, Ray Jewell, December, 1989.

[2]W.S. Durant, D,F. Baughman, P.L. Fisk, B.M. Legler, "200 Area Fault Tree Data Bank — 1988 Status Report," DPST-89-355, March 14, 1989.

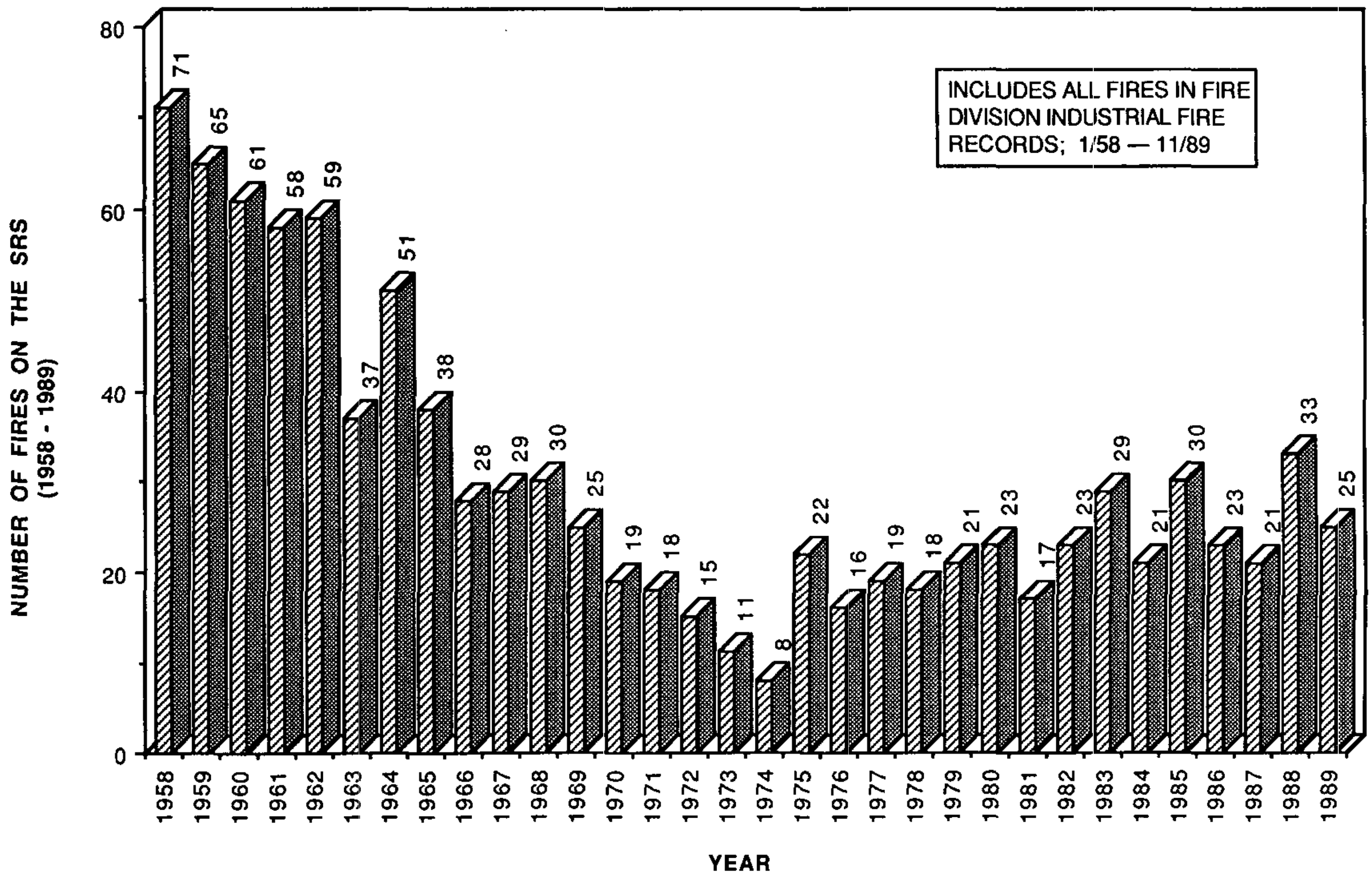


Figure 1. SRS fires by year

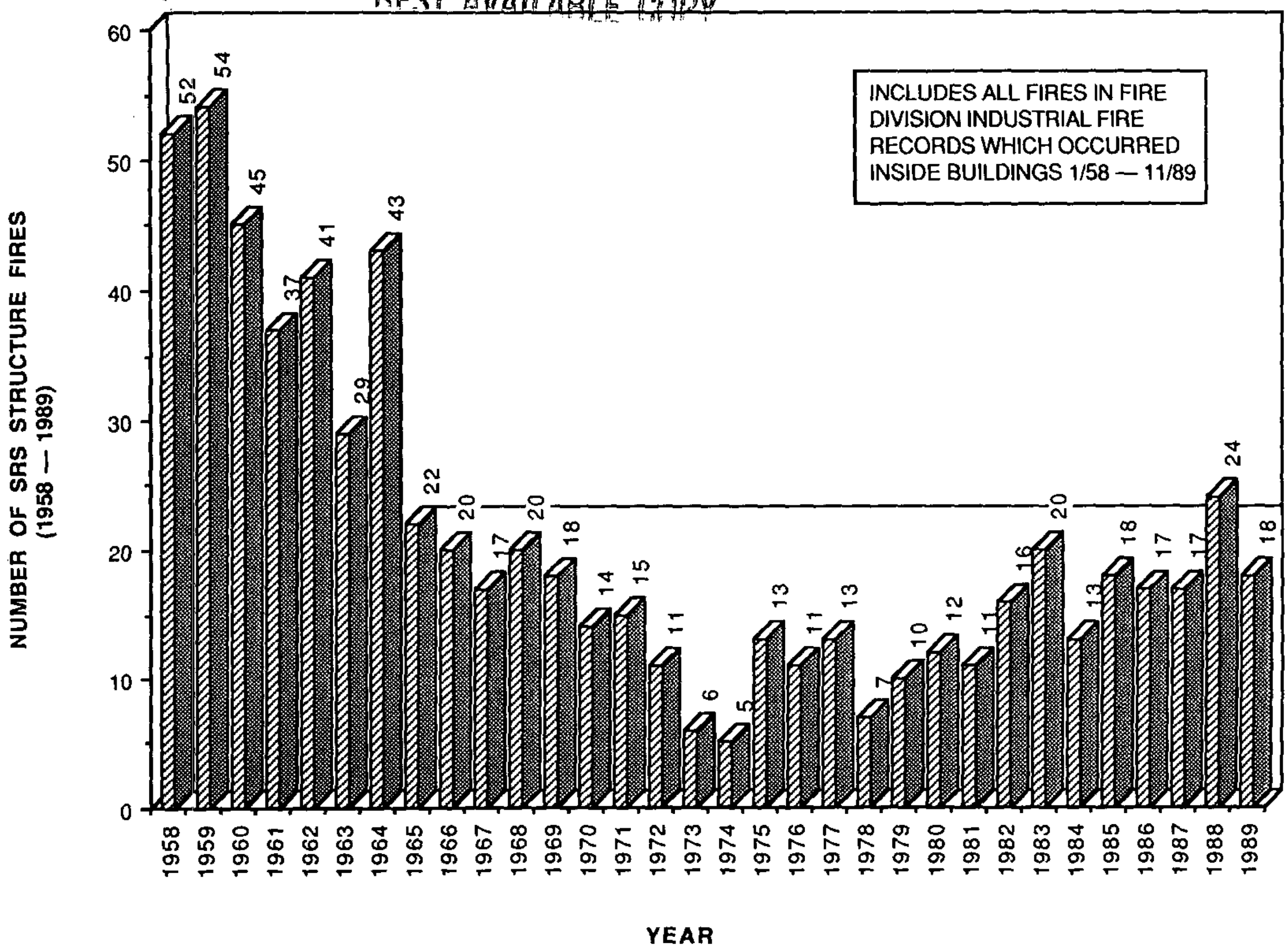


Figure 2. SRS structure fires by year

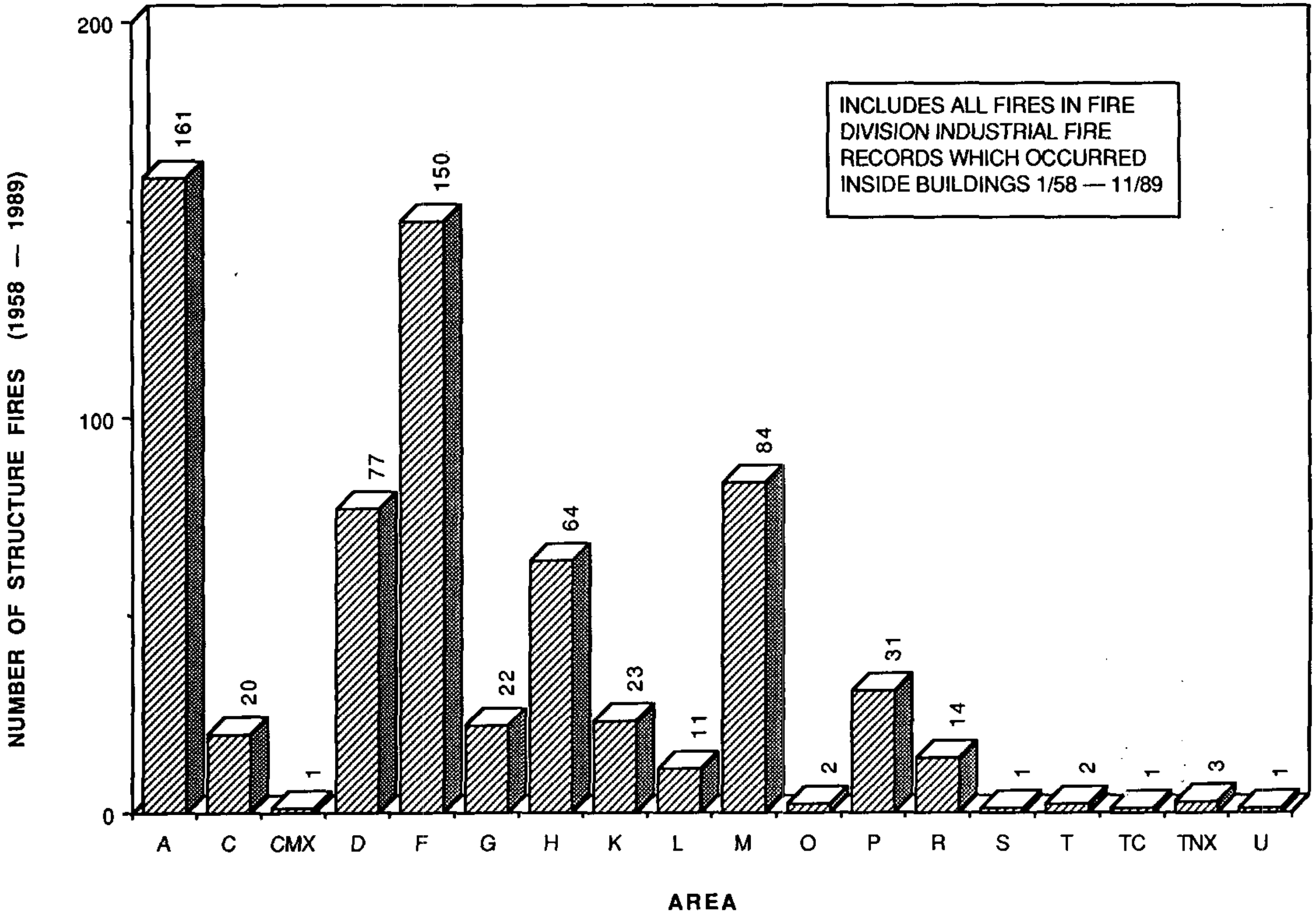


FIGURE 3. SRS STRUCTURE FIRE OCCURRENCES BY AREA

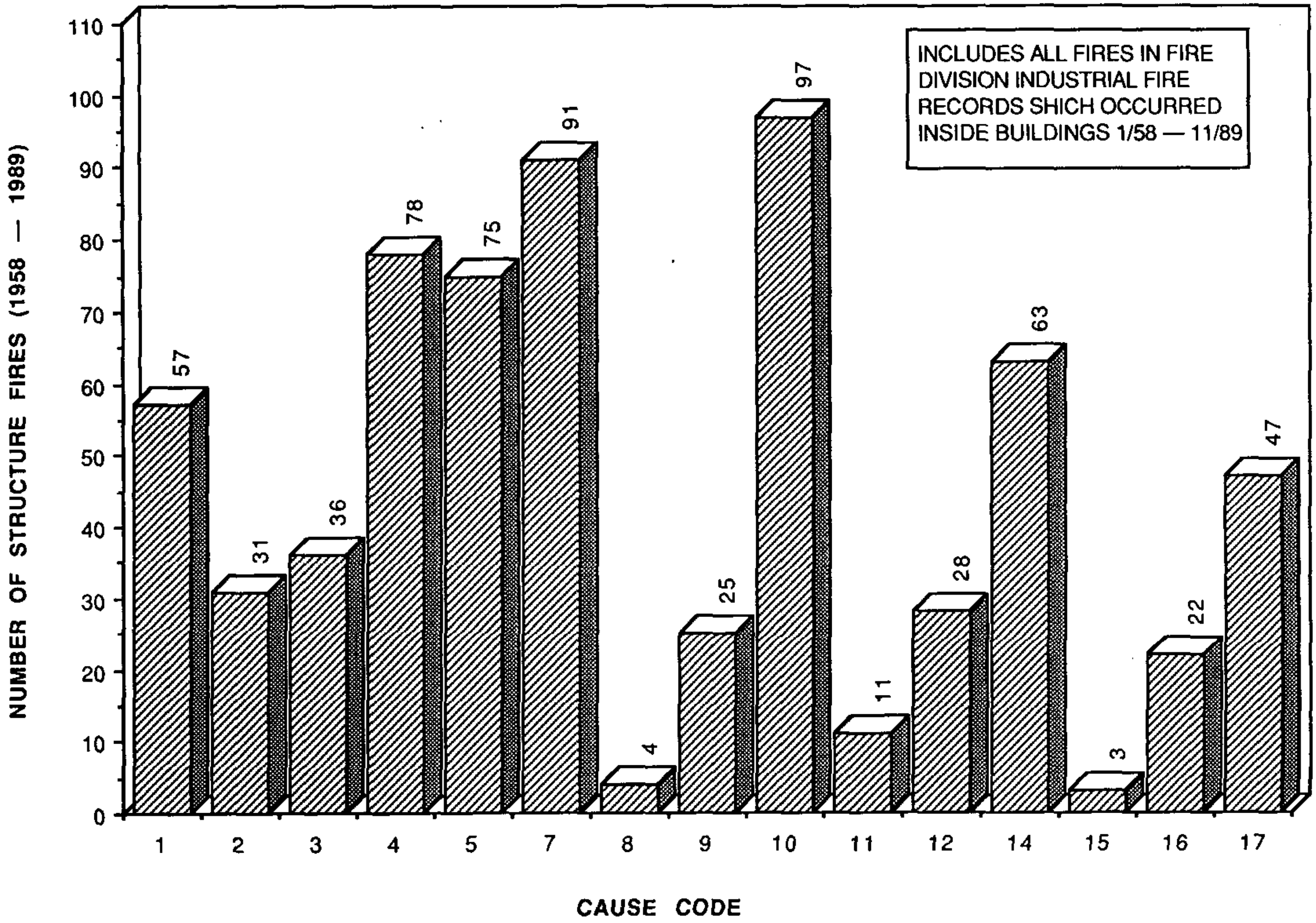


Figure 4. SRS structure fires by cause

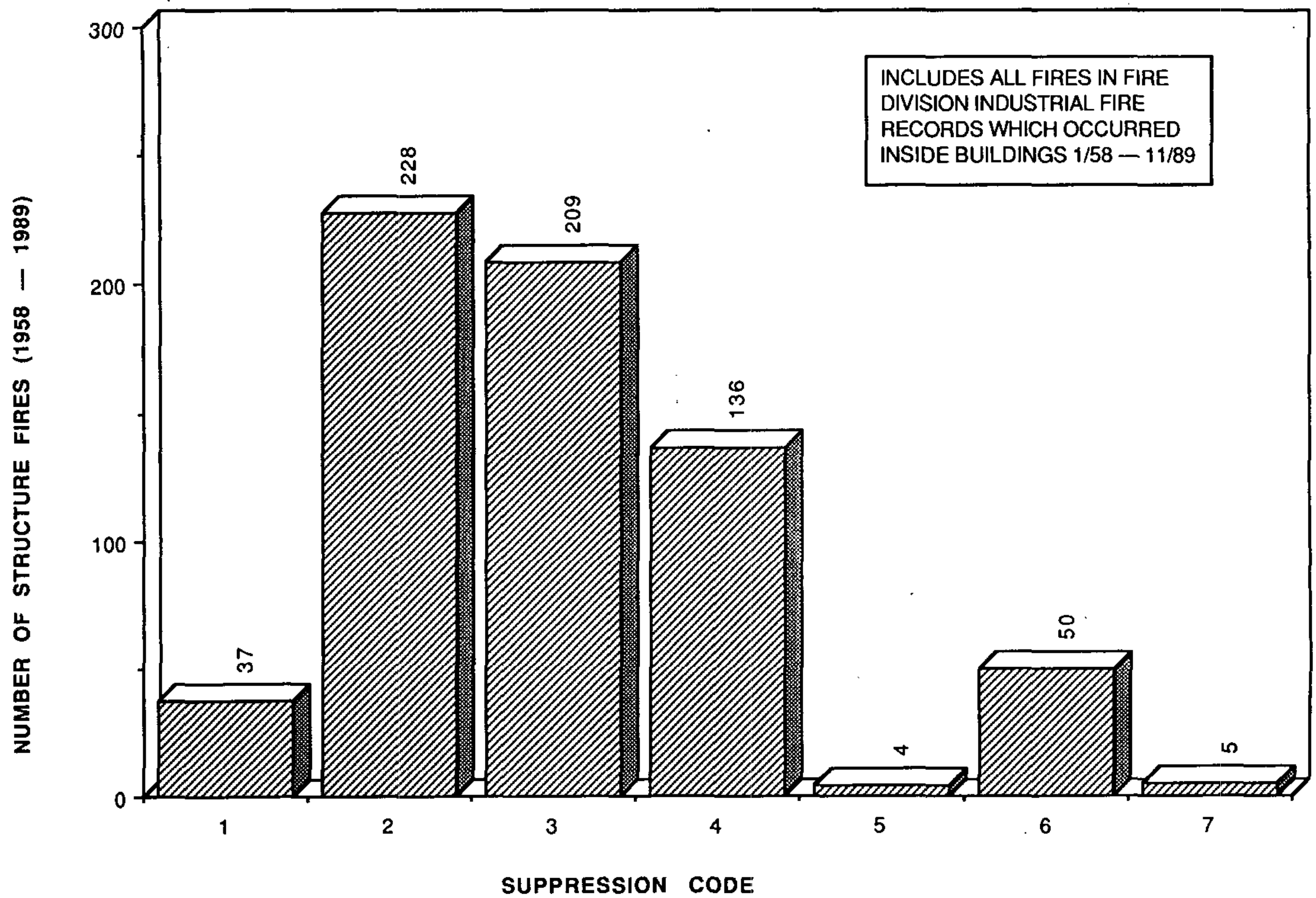


FIGURE 5. SRS structure fires by type of suppression necessary

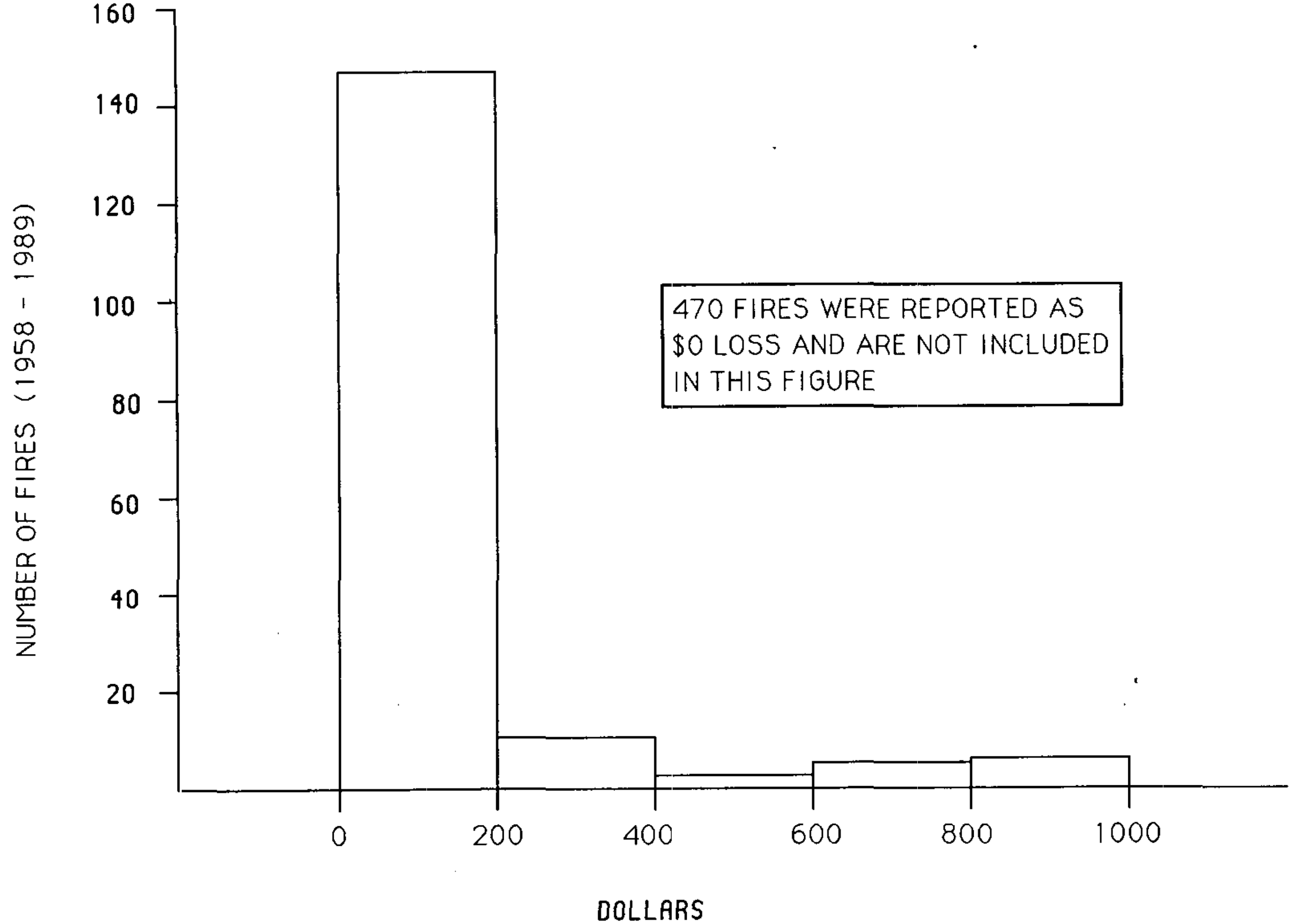


Figure 6. SRS structure fires with reported losses > $0 and < $1000.

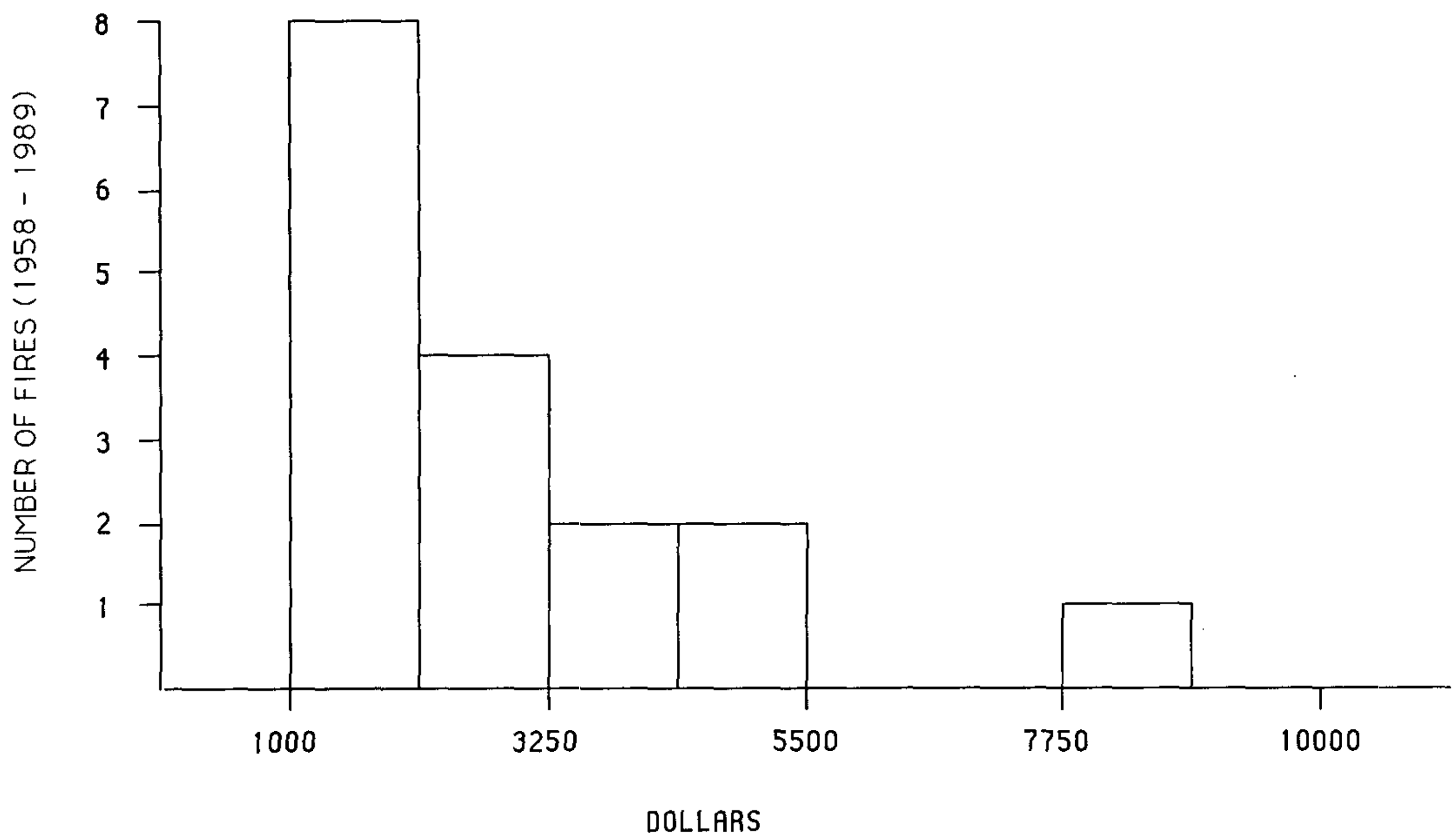


Figure 7. SRS structure fires with reported losses > $1000 and < $10,000

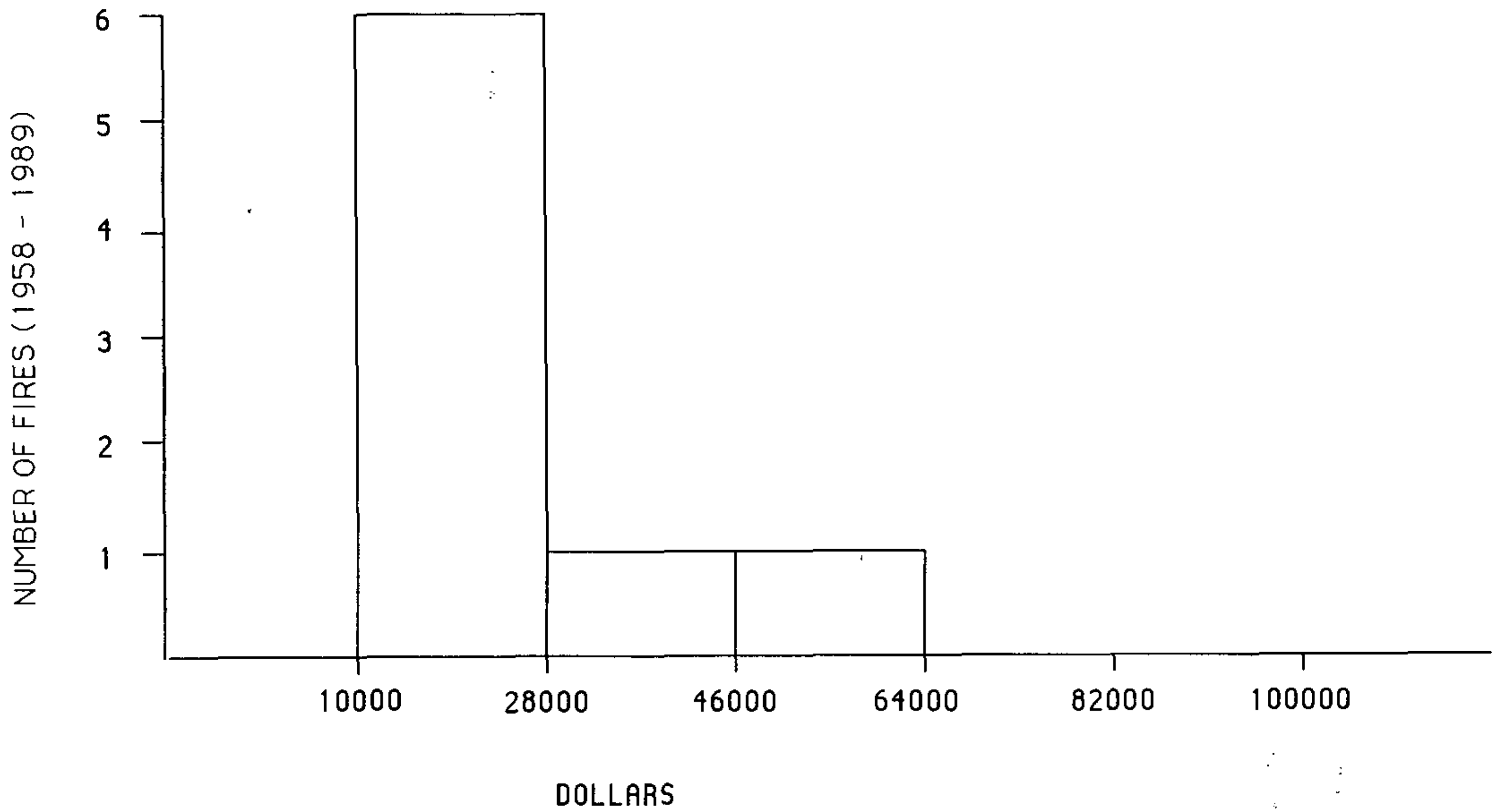


Figure 8. SRS structure fires with reported losses > $10,000 and < $100,000

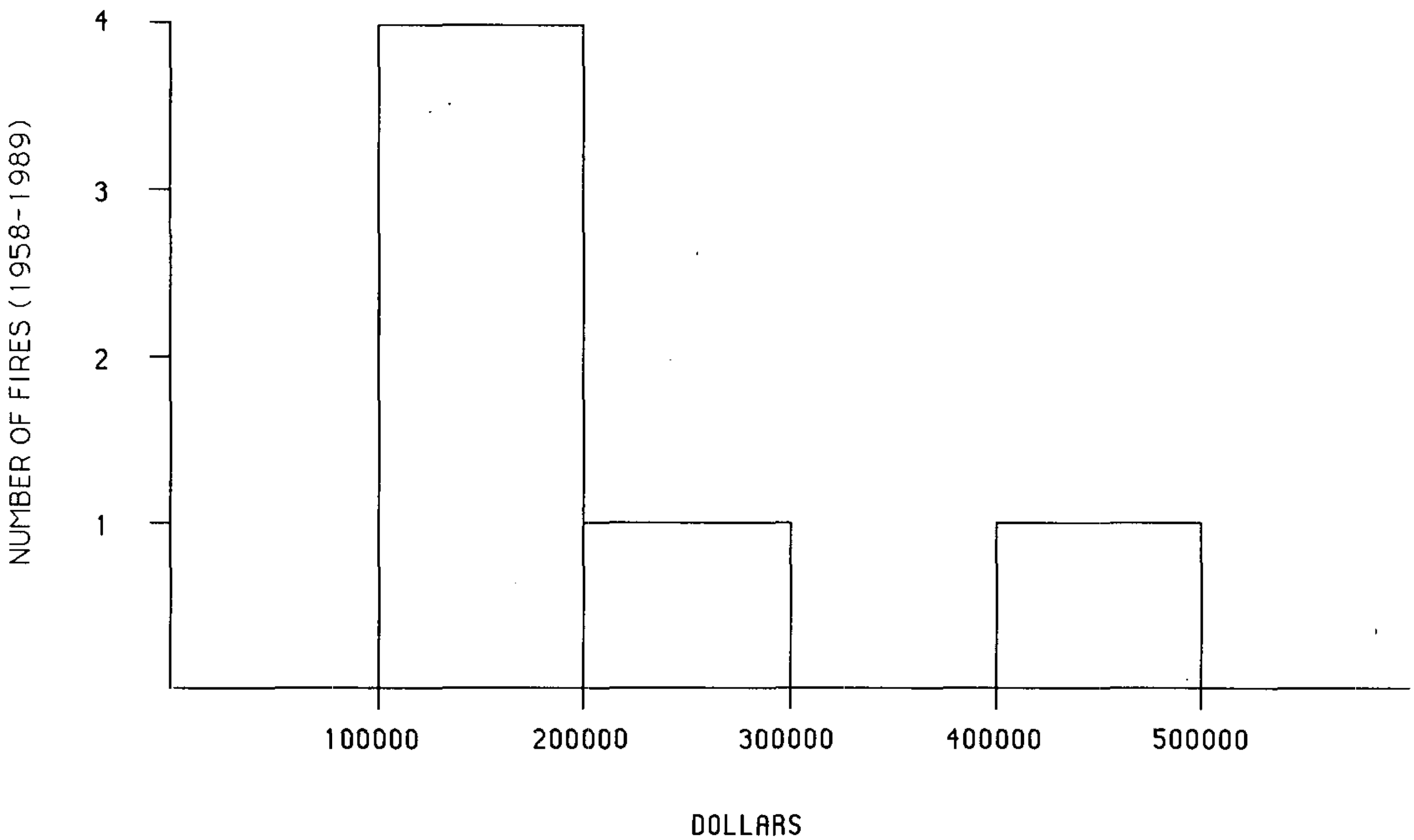


FIGURE 9. SRS STRUCTURE FIRES WITH REPORTED LOSSES > $100,000

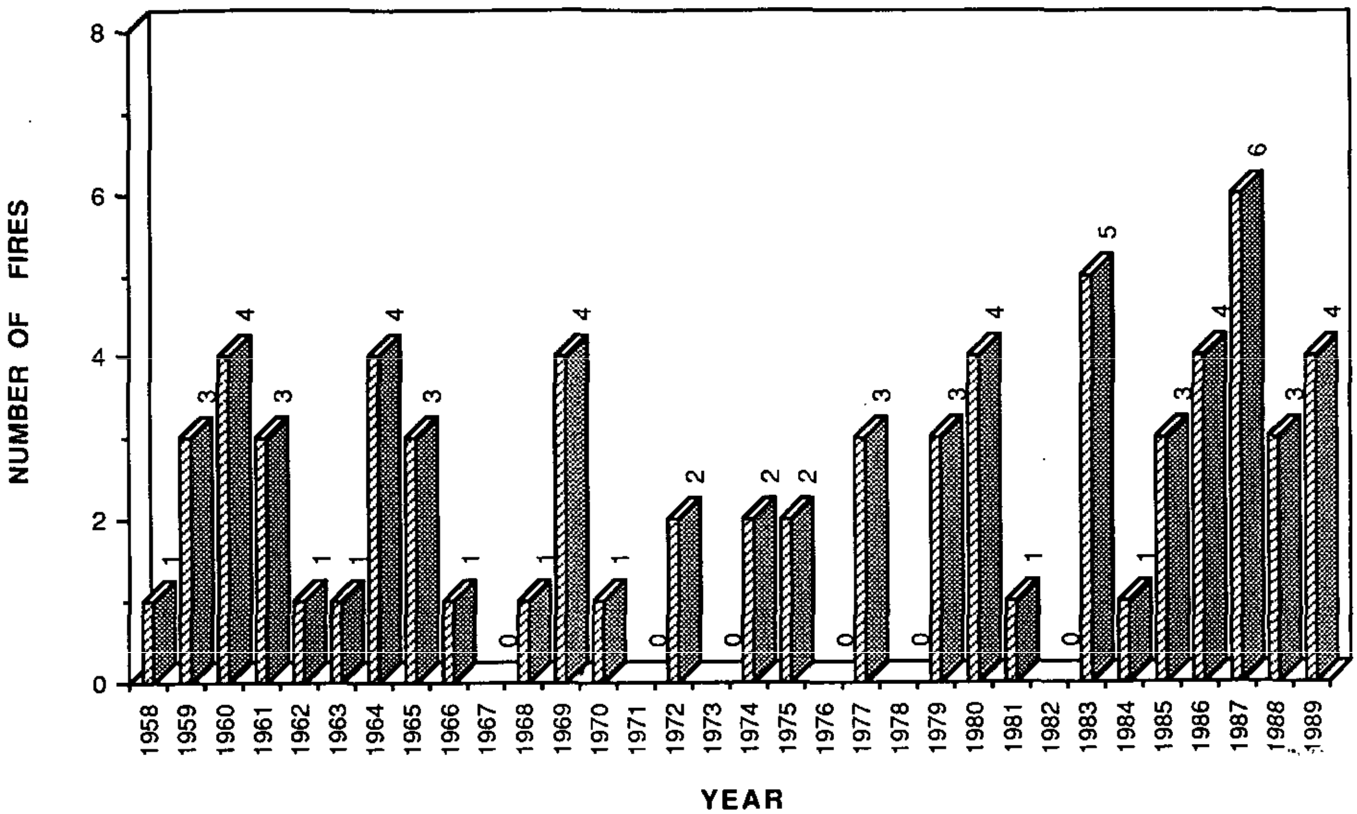


Figure 10. SRS fires by year included in "electrical shorts" cause category

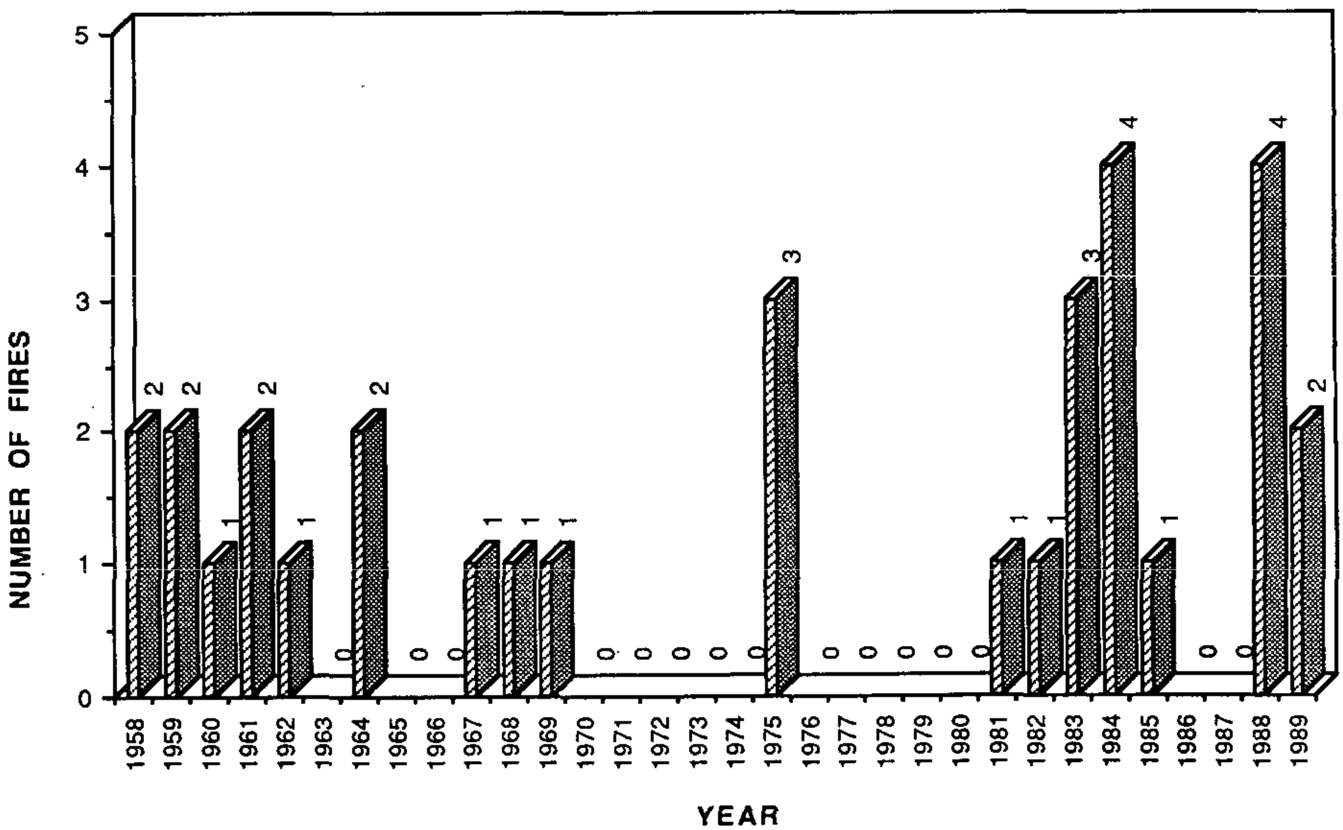


Figure 11. SRS fires by year included in "electrical overheating" cause category

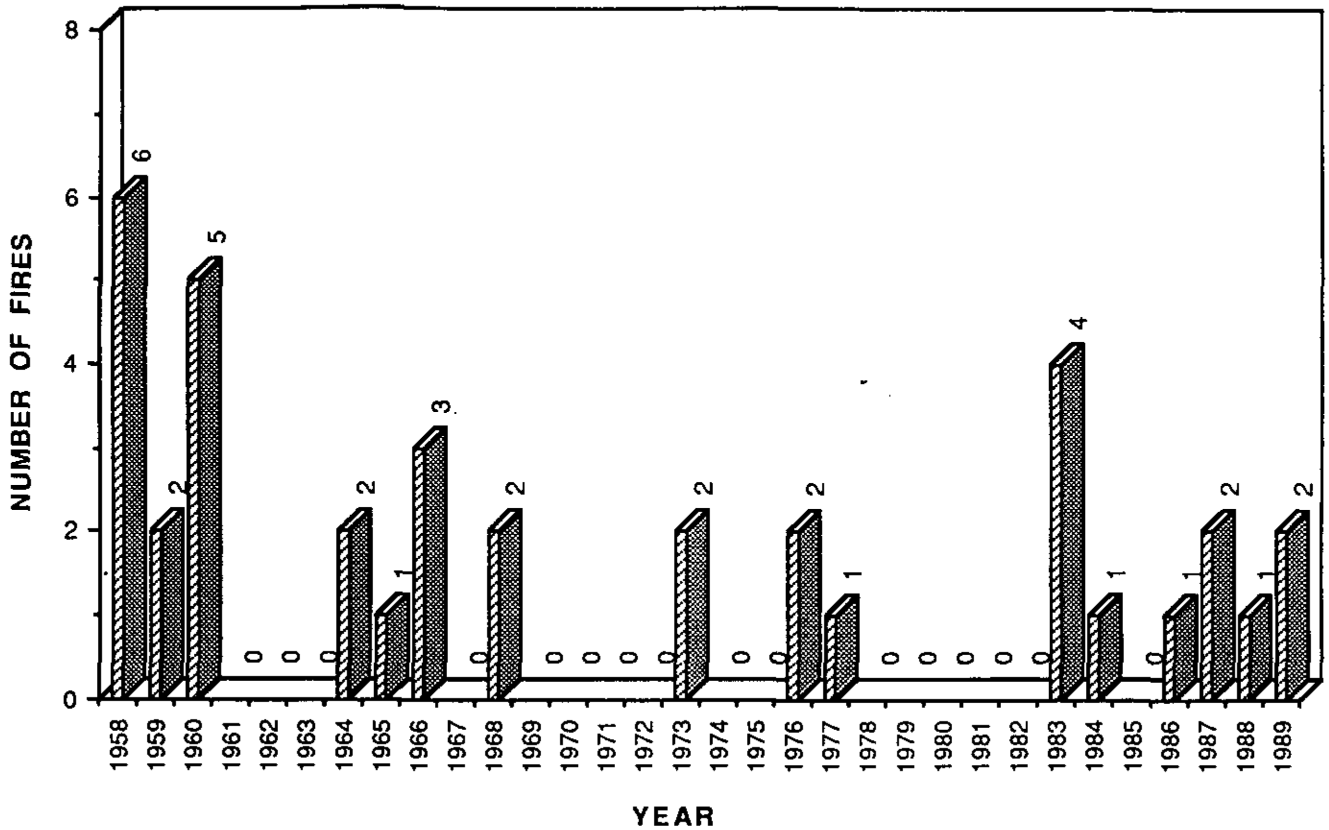


Figure 12. SRS fires by year included in "mechanical overheating" cause category

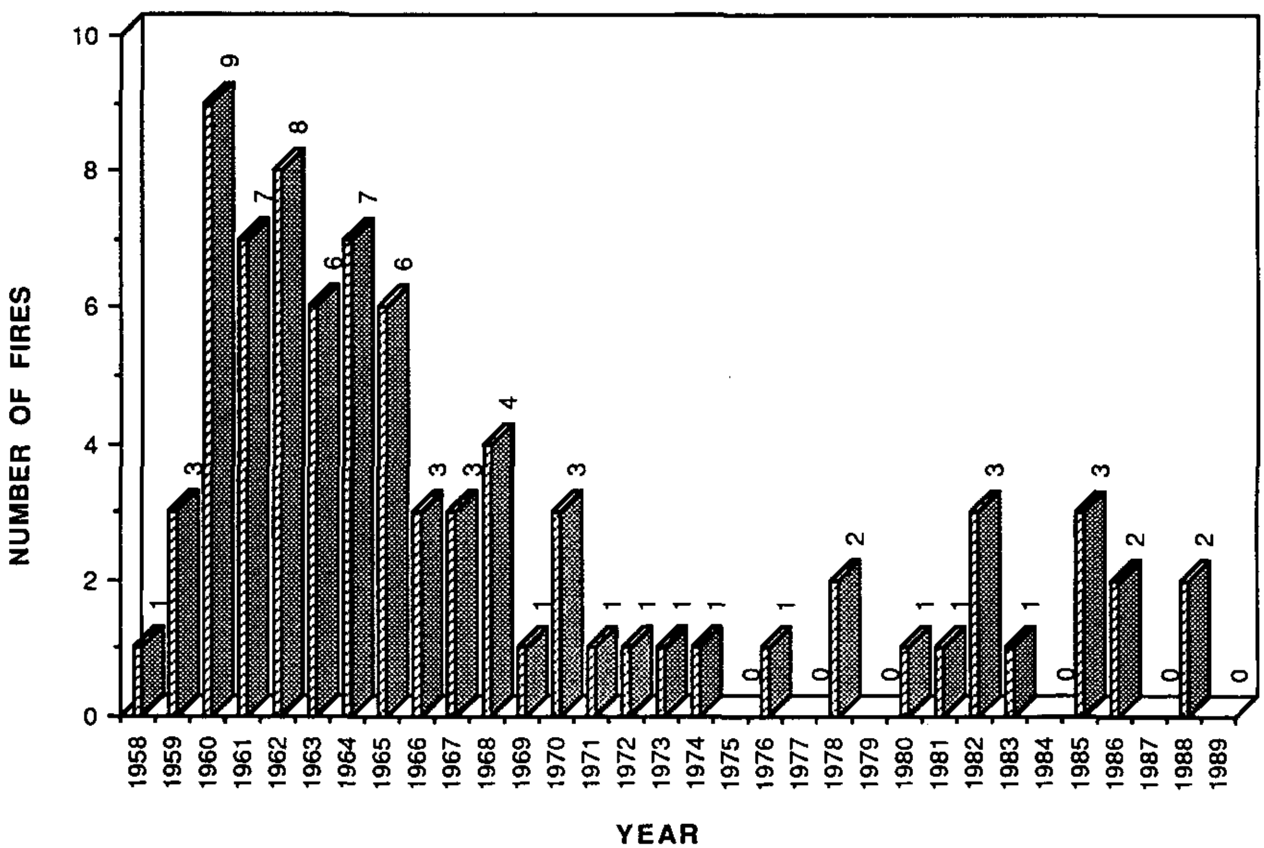


Figure 13. SRS fires by year included in "oil/hot object" cause category

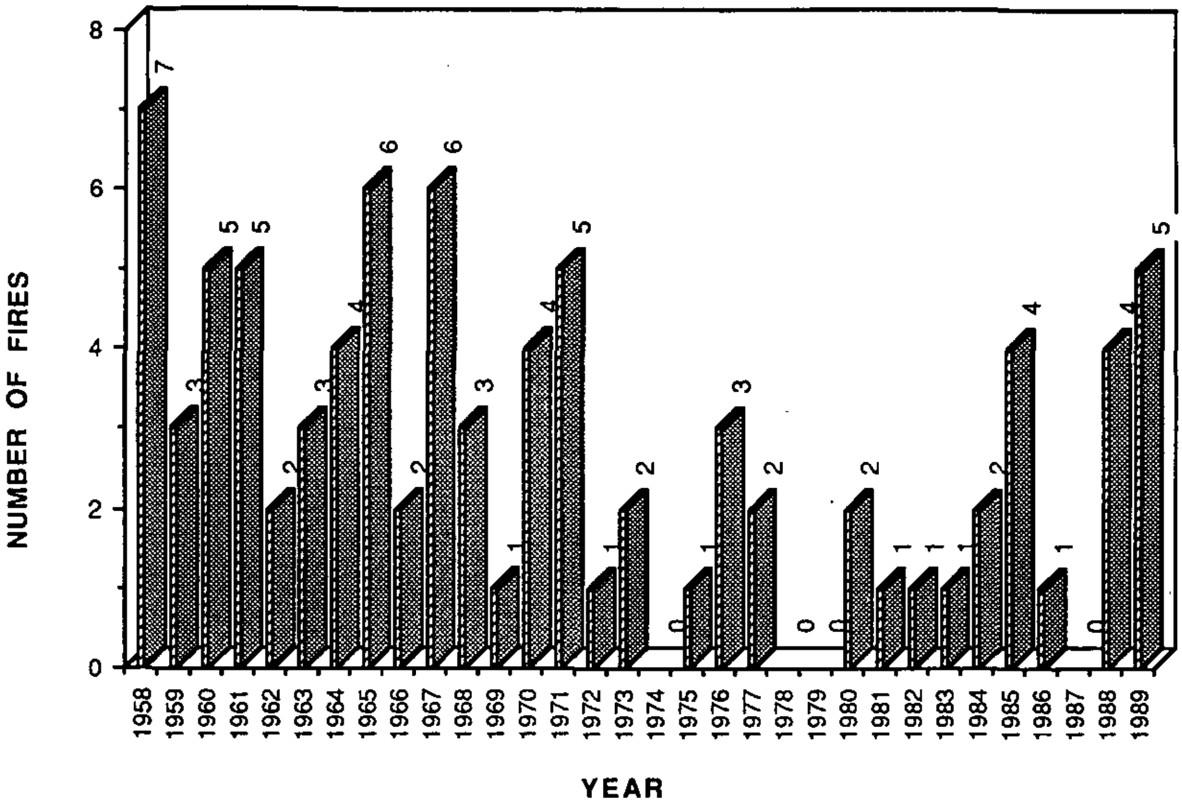


Figure 14. SRS fires by year included in "other material/ hot object" cause category

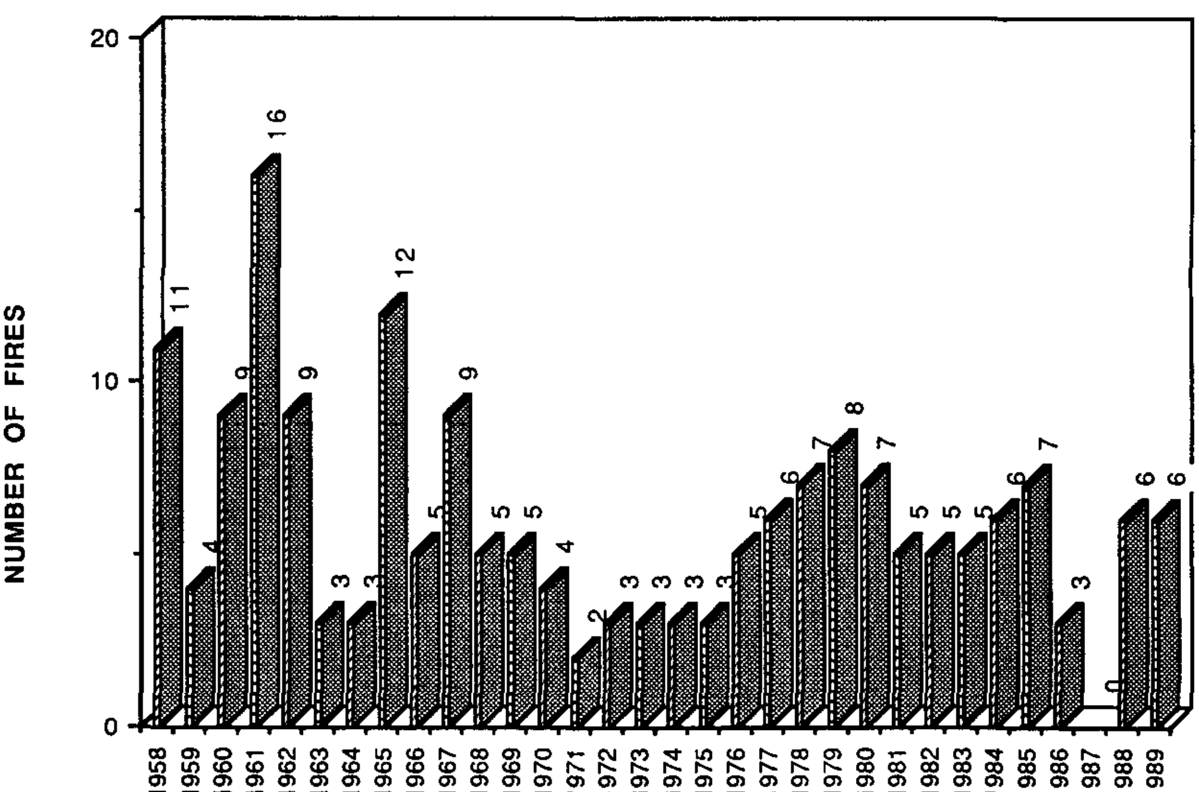


Figure 15. SRS fires by year included in "vehicle fire" cause category

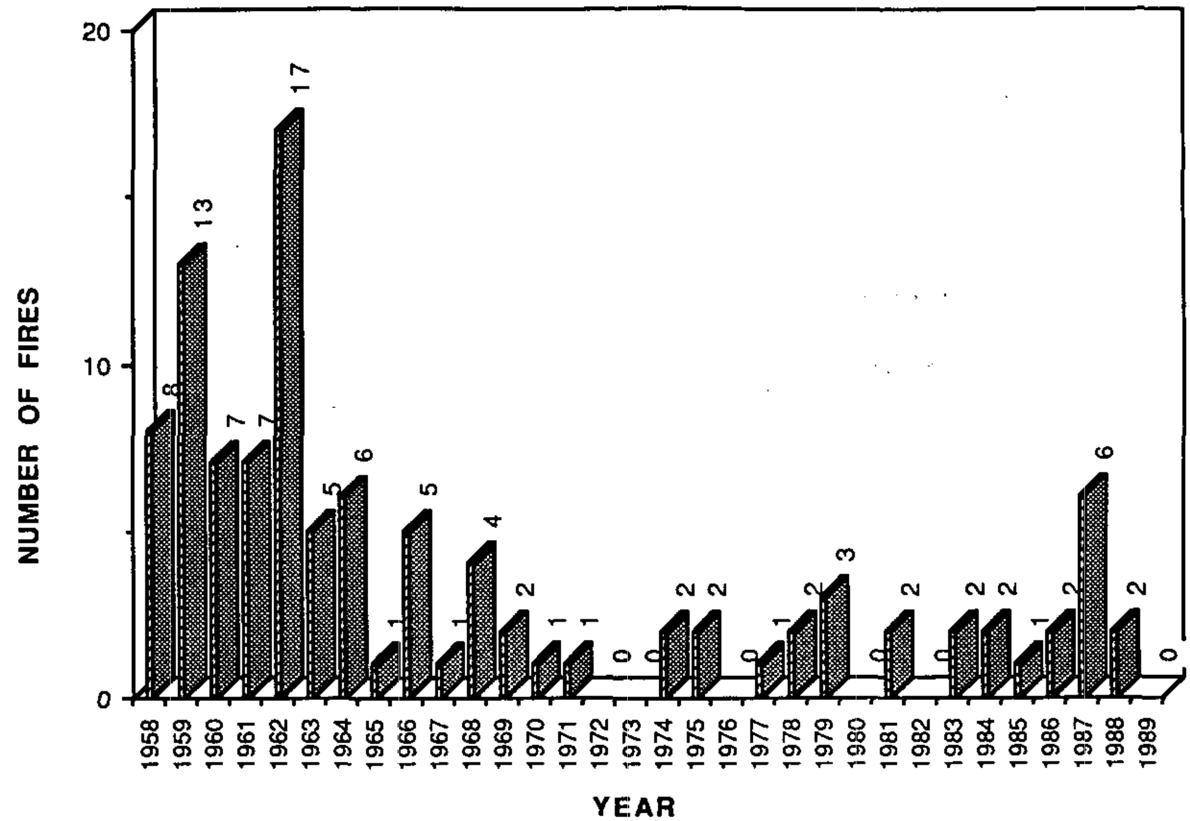


Figure 16. SRS fires by year included in "welding" cause category

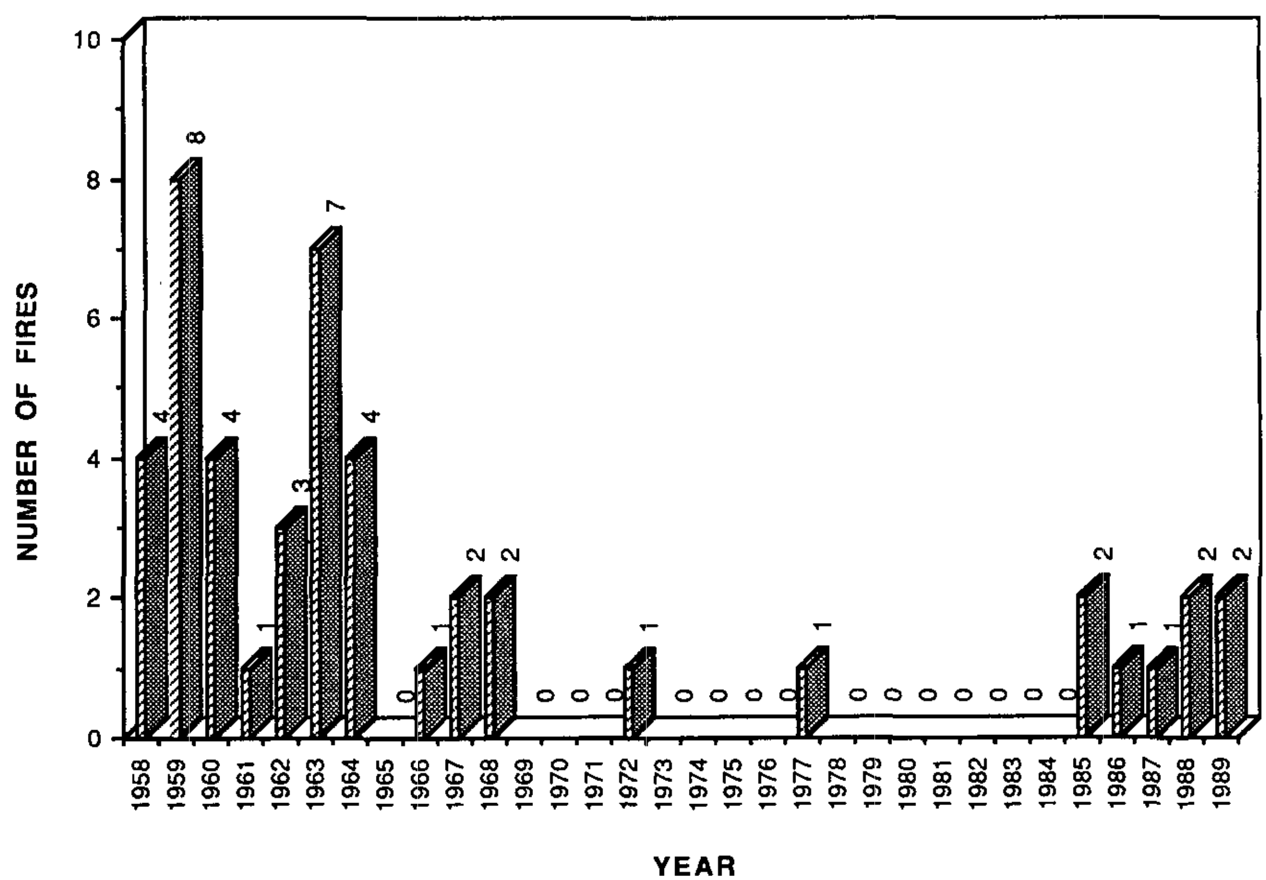


Figure 17. SRS fires by year included in "cigarette" cause category

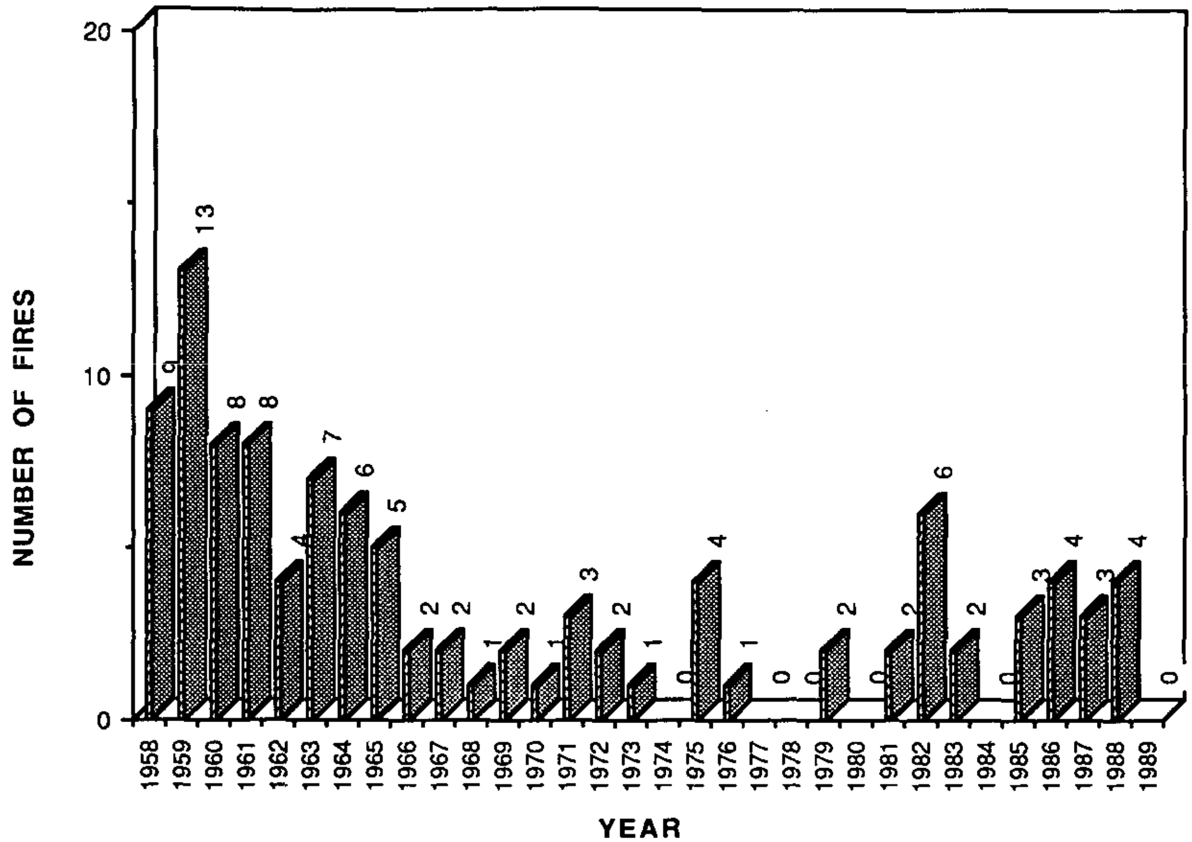


Figure 18. SRS fires by year included in "other maintainence/ shop work" cause categ

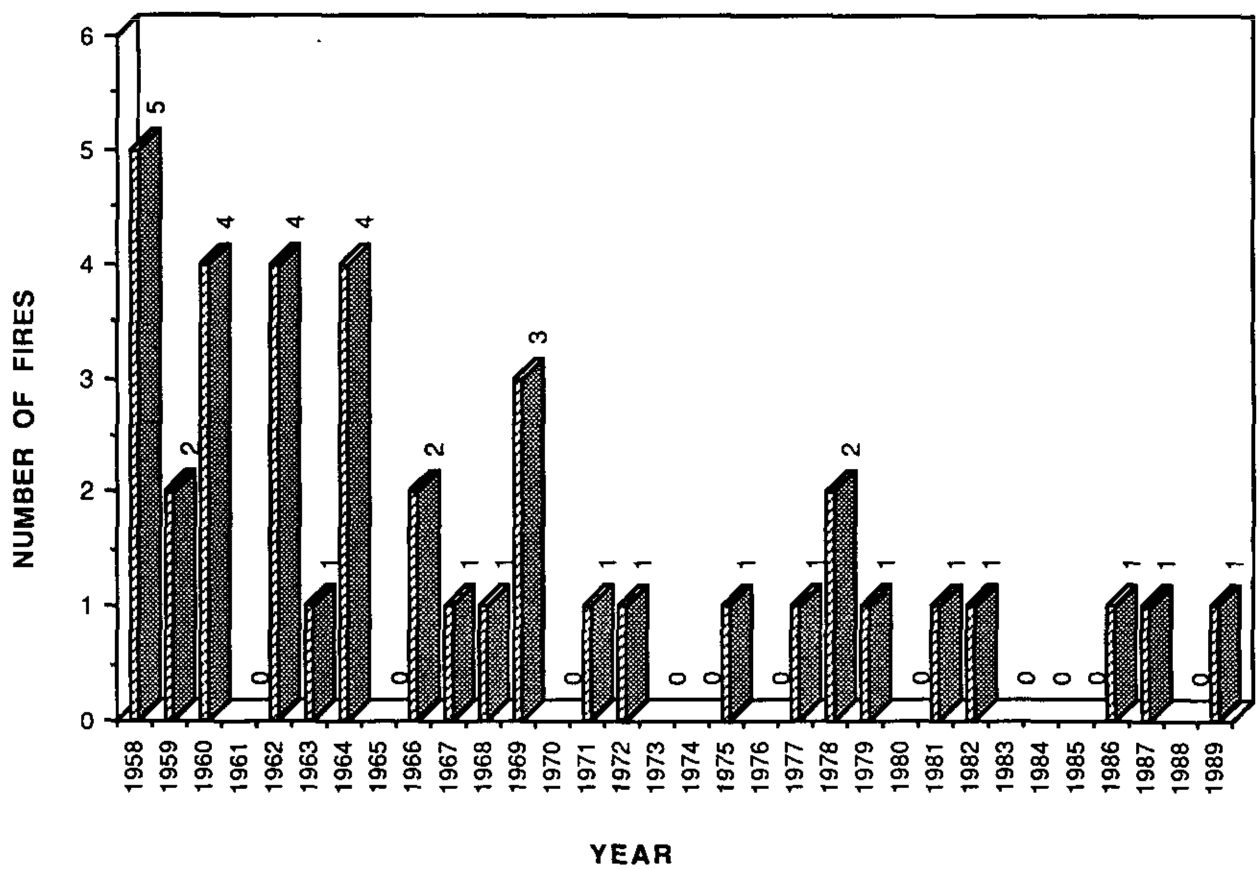


Figure 19. SRS fires by year included in "spontaneous combustion" cause category

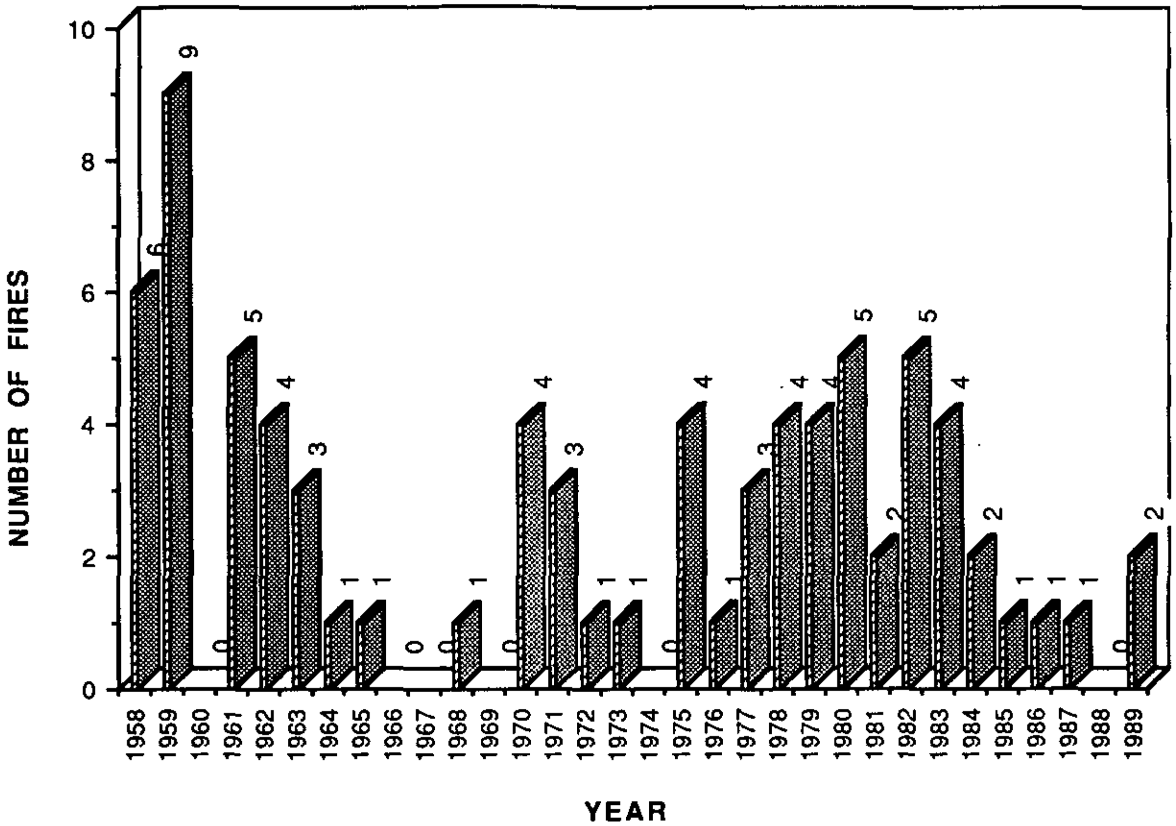


Figure 20. SRS fires by year included in "unknown" cause category

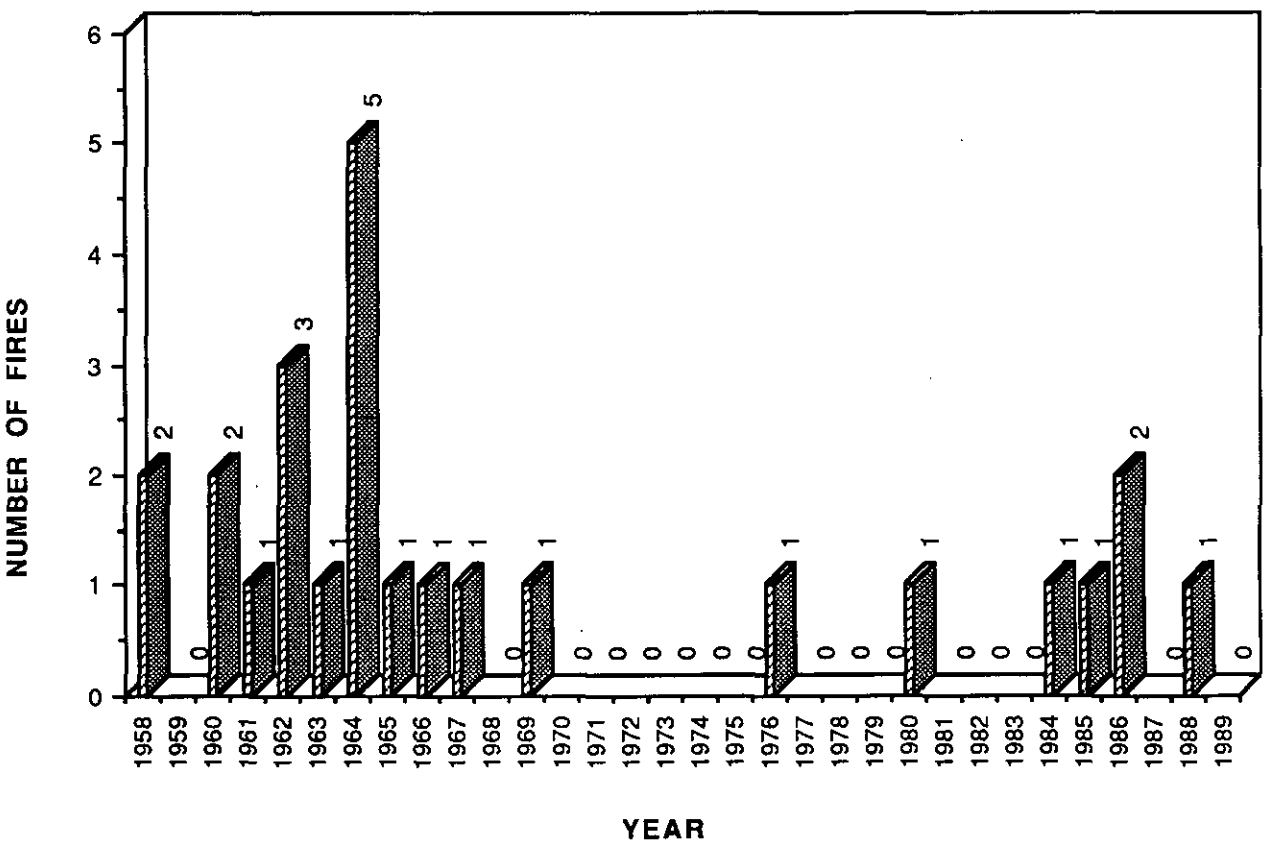


Figure 21. SRS fires by year included in "chemical reaction" cause category

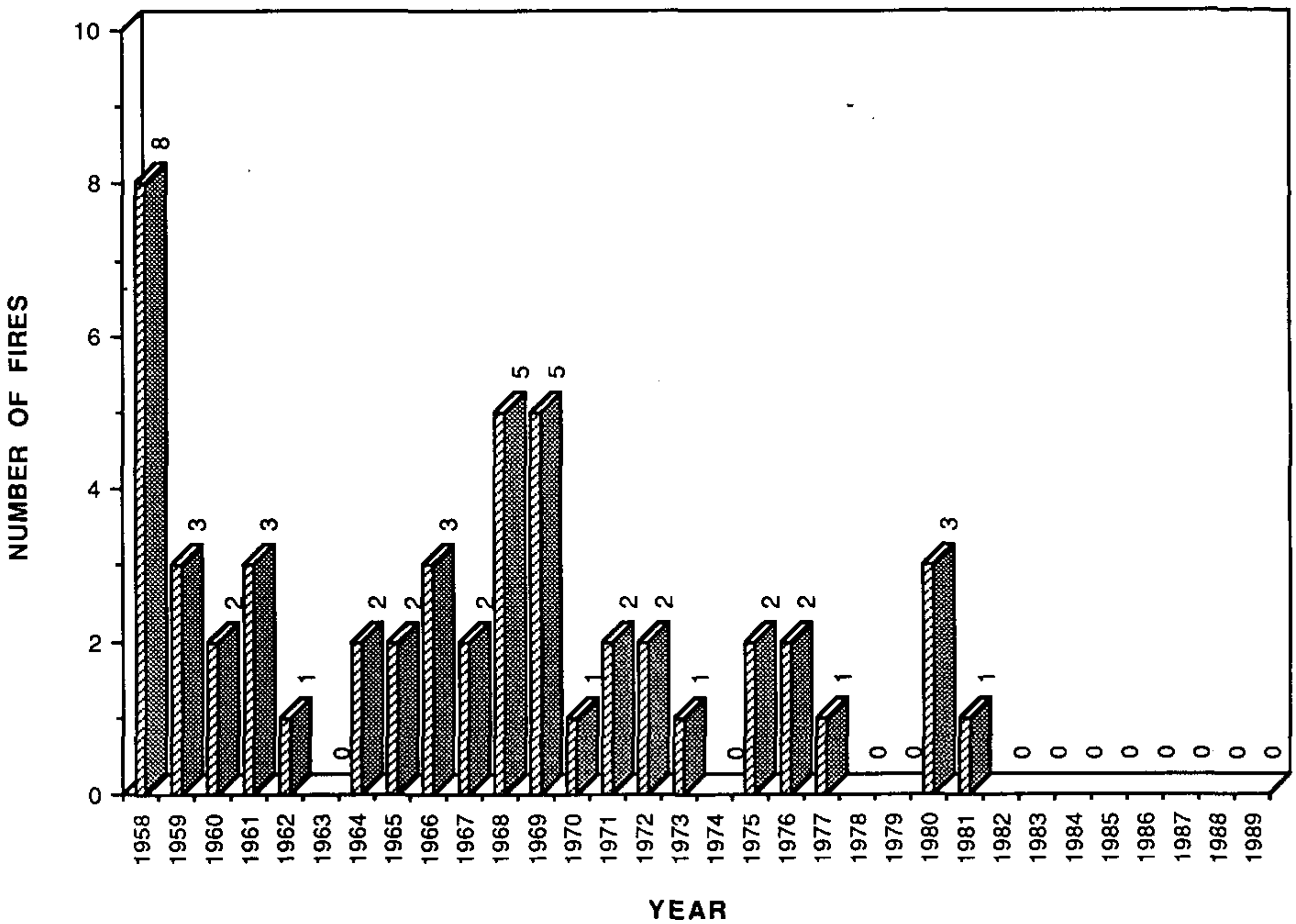


Figure 22. SRS fires by year included in "flammable gas" cause category

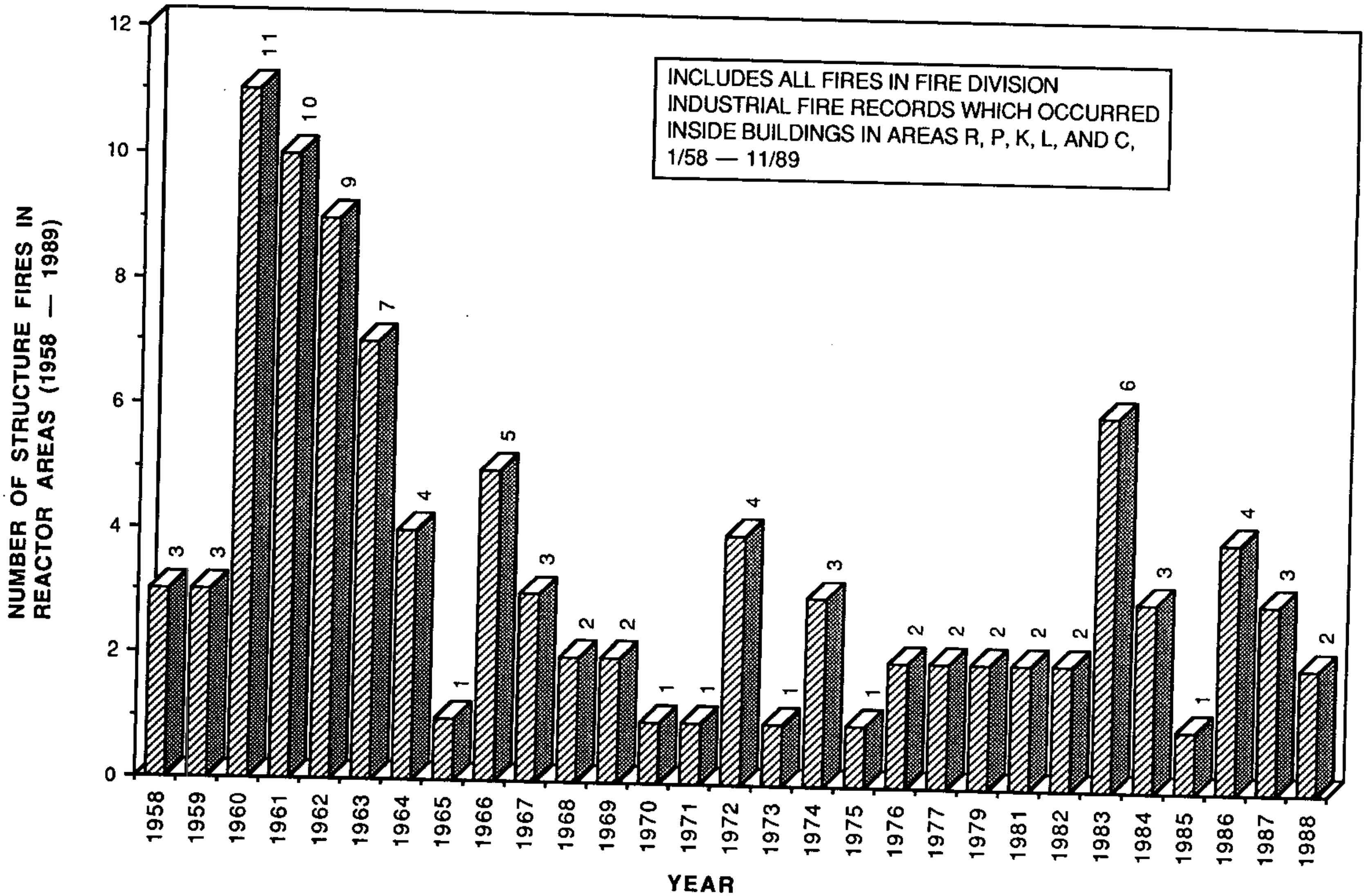

Figure 23. SRS reactor area structure fires by year

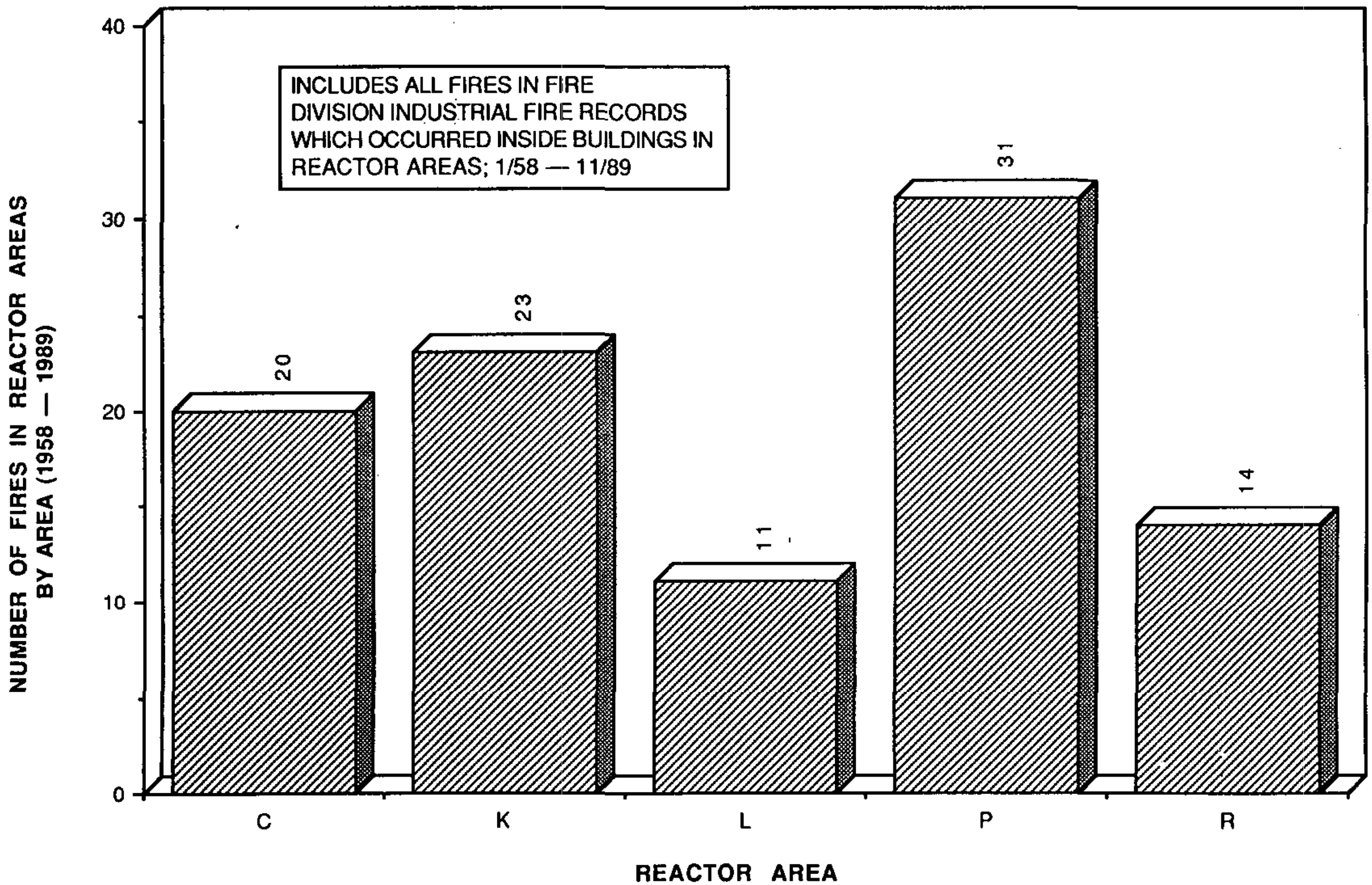


Figure 24. SRS reactor area structure fires by reactor area

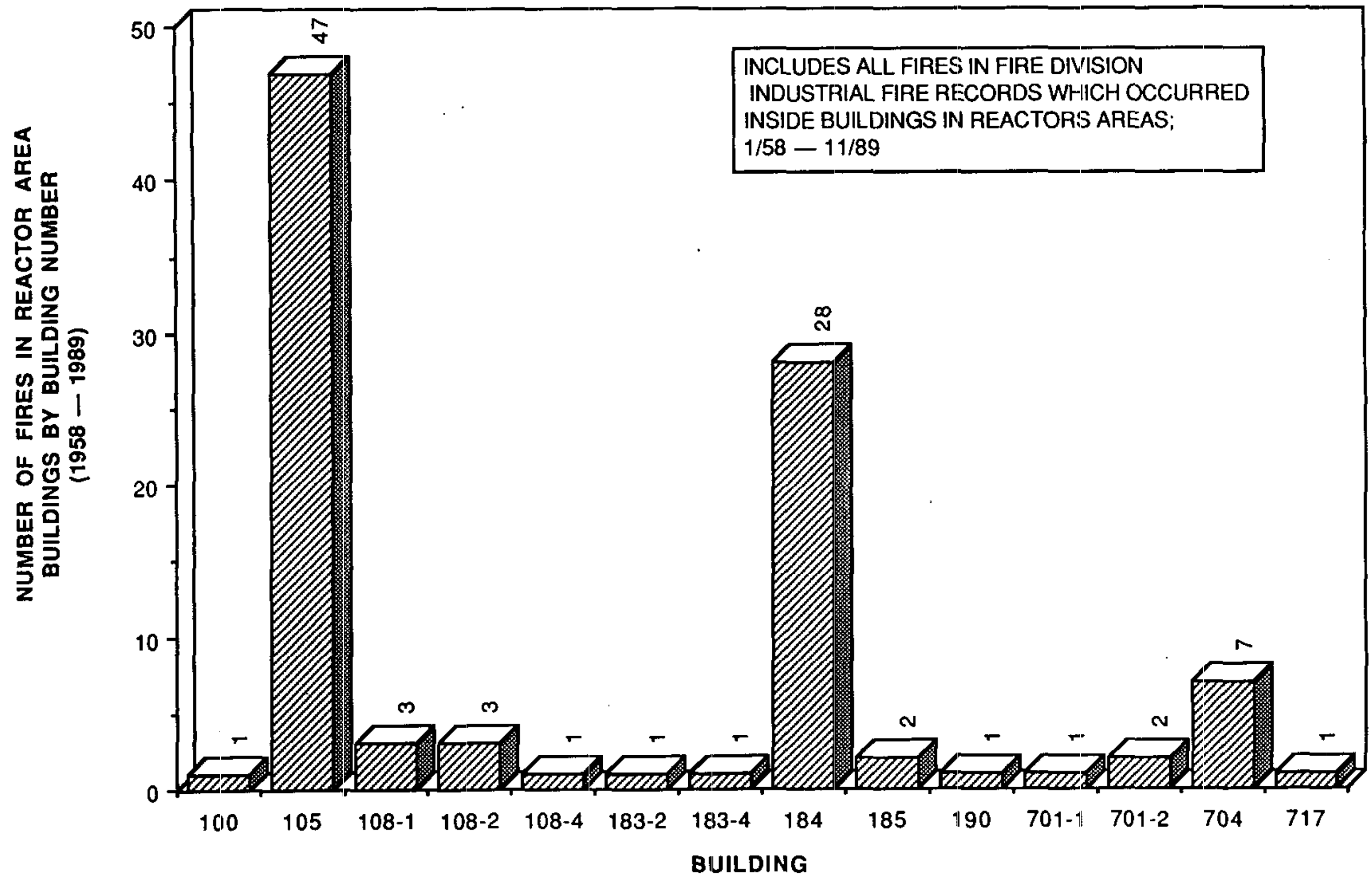


Figure 25. SRS reactor area structure fires by building number

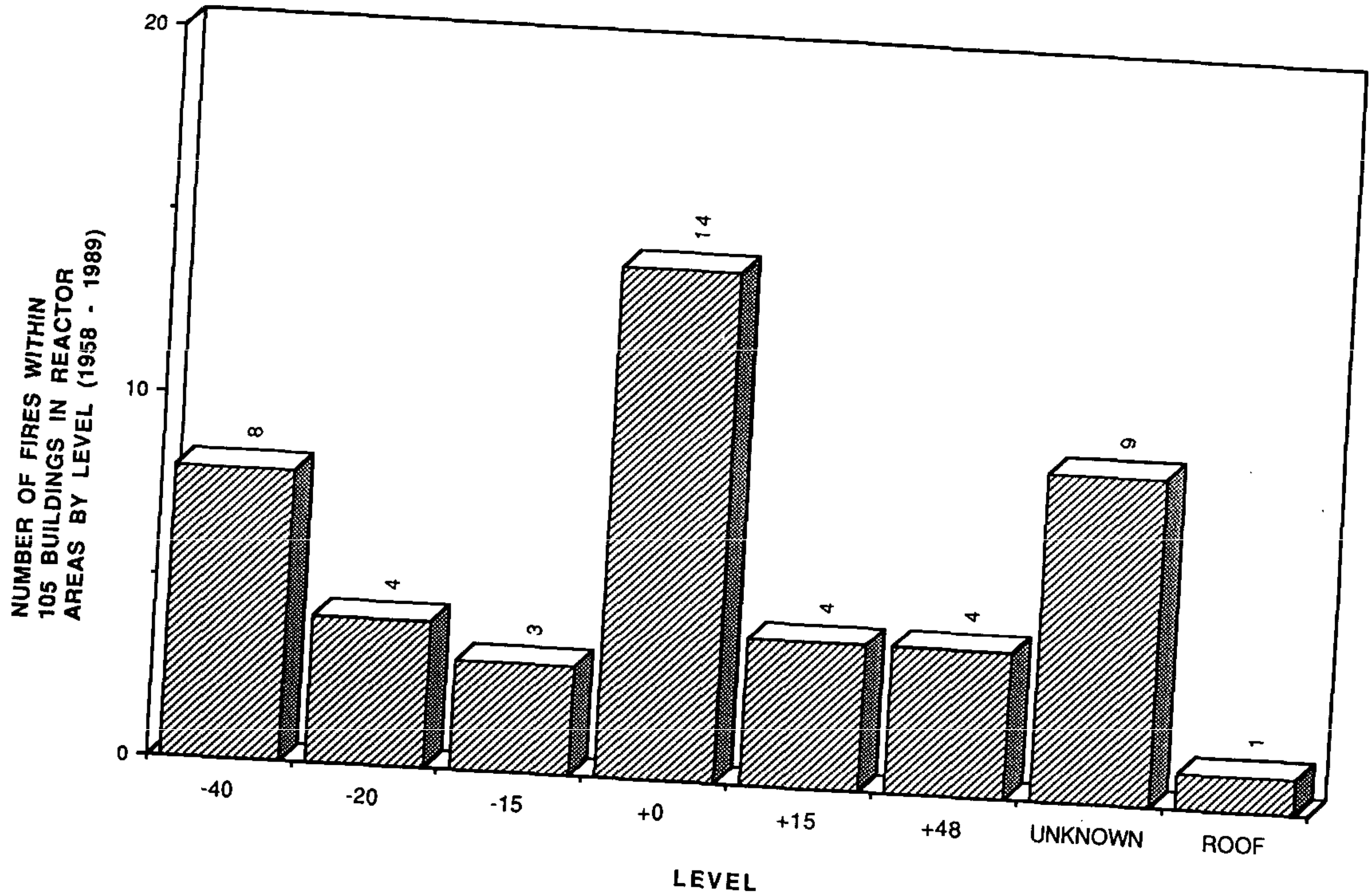


Figure 26. SRS reactor area 105 building fires by building level

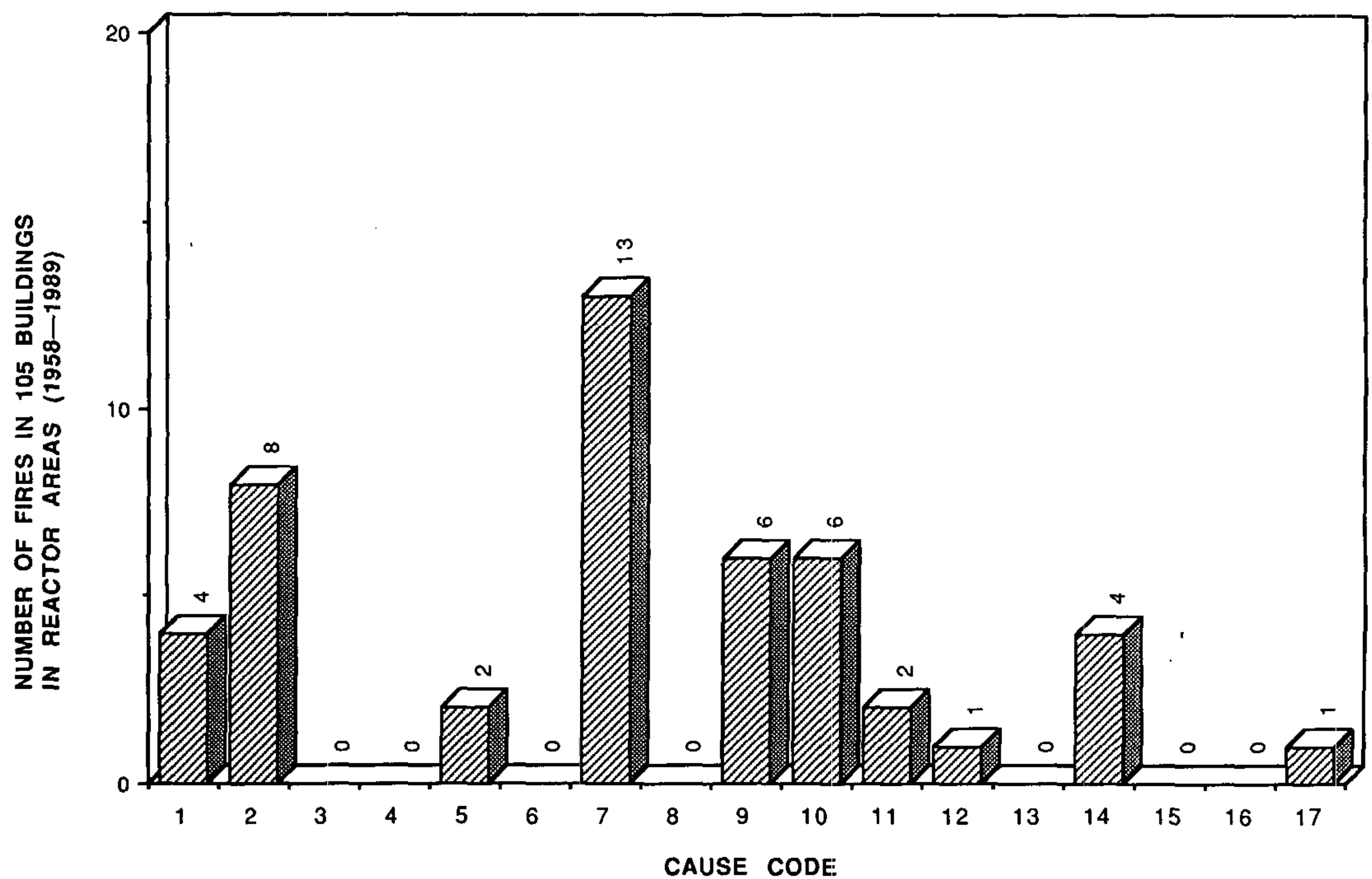


Figure 27. SRS reactor area 105 building fires by cause

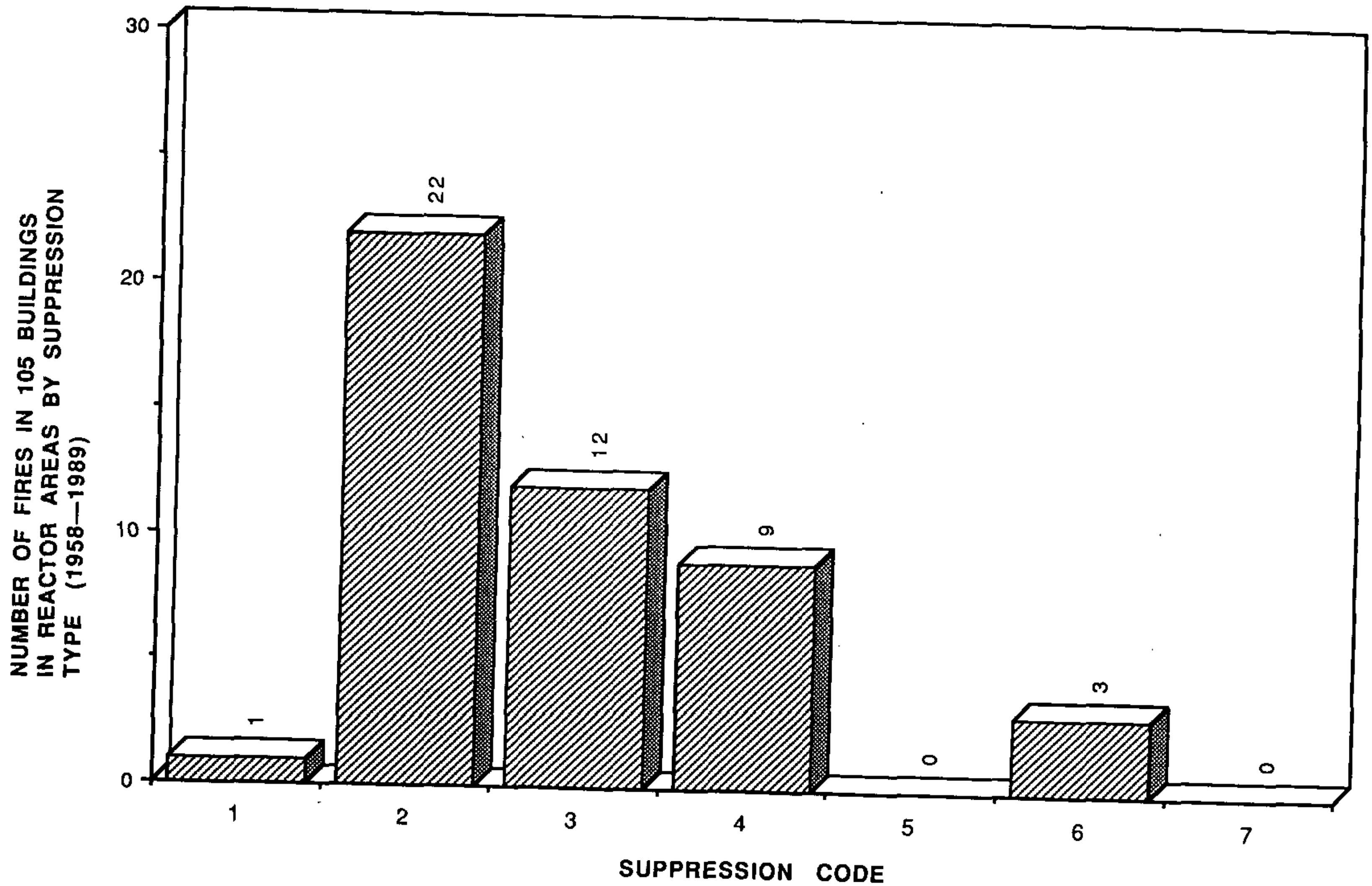


Figure 28. SRS reactor area 105 building fires by type of suppression utilized

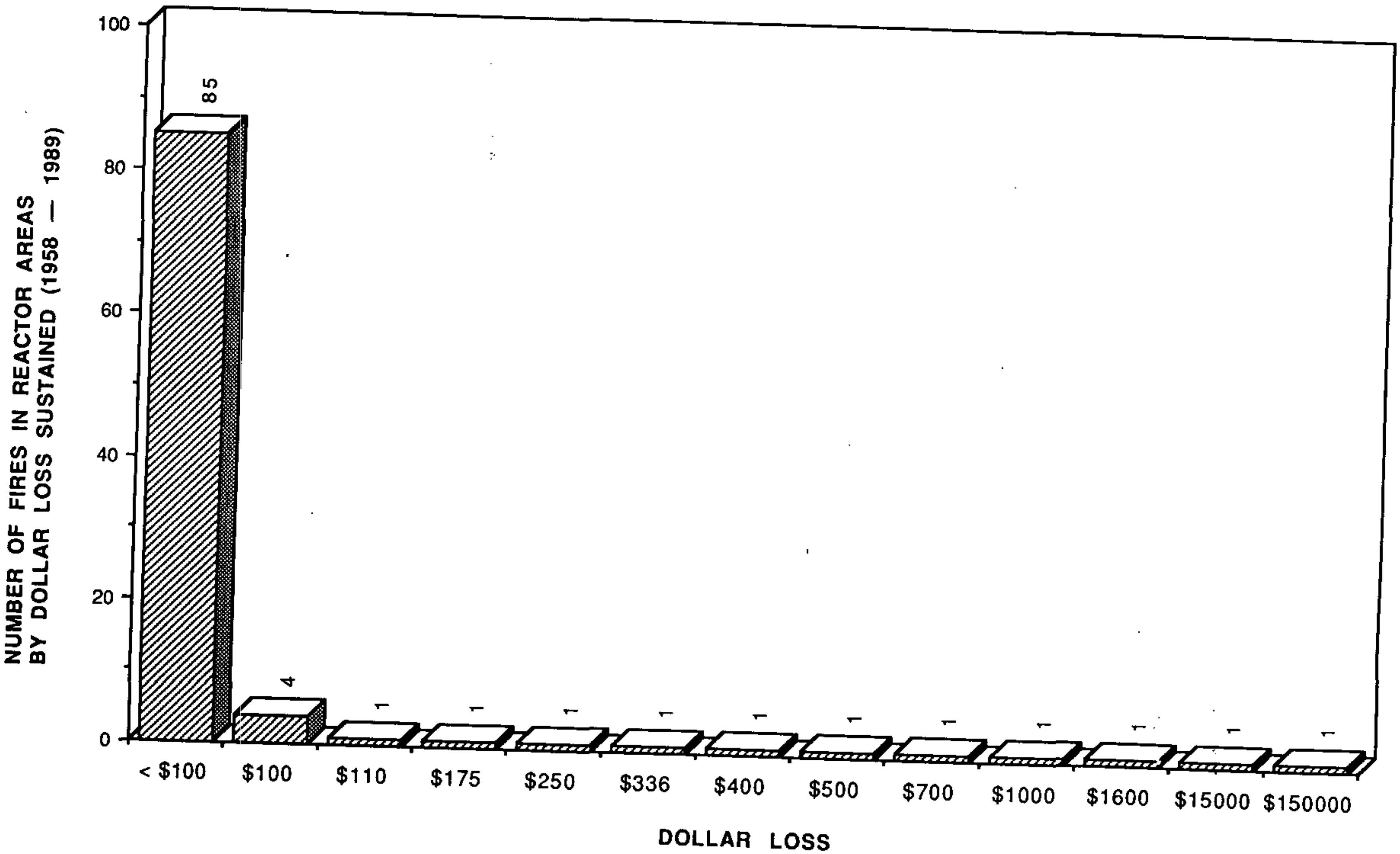


Figure 29. SRS reactor area structure fires by reported dollar loss

# APPENDIX A

# LARGE LOSS FIRE EVENTS

| | |
|---|---|
| **Date** | 3/18/60 |
| **Time** | 3:22 PM |
| **Building Number** | 412 |
| **Area** | D |
| **Description** | PROCESS $H_2S$ GAS AND INSULATION BURNED DUE TO AN IGNITION OF PROCESS GAS RELEASED WHEN GAS OUTLET LINE ERUPTED. FIRE DIVISION RESPONDED WITH A CHIEF, 6 FIREMEN, 10 VOLUNTEERS, A PUMPER AND A CHEMICAL TRUCK. FIRE EXTINGUISHED BY HOSE LINES. |
| **$Damage** | $135,300 |
| **Cause Code** | 17 |
| **Suppression Code** | 4 |
| **Material Ignited** | $H_2S$ GAS AND INSULATION |

| | |
|---|---|
| **Date** | 12/3/75 |
| **Time** | 1:15 AM |
| **Building Number** | 484 |
| **Area** | D |
| **Description** | A FUEL RICH MIXTURE OF PULVERIZED COAL AND OIL WAS BEING FIRED IN THE #1 BOILER PRECIPITATOR, BUILDING 484-D. SOMETIME DURING THE PERIOD ALL THE CONDITIONS OF FUEL, OXYGEN, AND IGNITION WERE MET IN THE ELECTROSTATIC PRECIPITATOR COLLECTOR SYSTEM AND COMBUSTION OCCURED. |
| **$Damage** | $400,000 |
| **Cause Code** | 12 |
| **Suppression Code** | 6 |
| **Material Ignited** | COAL |

| | |
|---|---|
| **Date** | 7/25/79 |
| **Time** | 1:44 PM |
| **Building Number** | 751 |
| **Area** | A |
| **Description** | FIRE BURNED ELECTRICAL EQUIPMENT IN THE SUPERVISORY CONTROL PANEL FOR THE 115 KV PLANT POWER SUPPLY. CAUSE OF THE FIRE WAS AN ELECTRICAL SHORT. THE FIRE HAS CAUSED A TEMPORARY LOSS OF THE PANEL. |
| **$Damage** | $150,000 |
| **Cause Code** | 1 |
| **Suppression Code** | 6 |
| **Material Ignited** | ELECTRICAL EQUIPMENT |

| | |
|---|---|
| **Date** | 2/19/86 |
| **Time** | 1:40 PM |
| **Building Number** | 251 |
| **Area** | F |
| **Description** | A FIRE OCCURED AT 251-F , TRANSFORMER NO. 1. THE FIRE IS SUSPECTED TO HAVE BEEN CAUSED BY INTERNAL GROUND FAULT WHICH CAUSED THE TRANSFORMER TO EXPLODE AND IGNITE THE OIL. THE FIRE WAS EXTINGUISHED BY THE FIRE DIVISION AND FIRE BRIGADE. DAMAGE UNKNOWN AT THIS TIME. |
| **$Damage** | 228,000 |
| **Cause Code** | 1 |
| **Suppression Code** | 4 |
| **Material Ignited** | TRANSFORMER OIL |

| | |
|---|---|
| **Date** | 10/6/86 |
| **Time** | 2:07 PM |
| **Building Number** | O |
| **Area** | L |
| **Description** | A FIRE OCCURED IN THE SUBSTATION OUTSIDE 105-L. 13.8KV SWITCHGEAR AND WIRING SHORTED AND IGNITED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE UNKNOWN AT THIS TIME. |
| **$Damage** | 150,000 |
| **Cause Code** | 1 |
| **Suppression Code** | 3 |
| **Material Ignited** | ELECTRICAL WIRE |

| | |
|---|---|
| **Date** | 8/25/89 |
| **Time** | 8:56 AM |
| **Building Number** | 484 |
| **Area** | D |
| **Description** | A FIRE OCCURED IN 484-D SWITCH GEAR ROOM #3 2300 VOLT BUS. FIRE WAS CAUSED WHEN 2300 VOLT BREAKER "RACKED IN" IN CLOSED POSITION. ELECTRICAL CONNECTIONS BEGAN TO ARC AND GOT HOT, CAUSING INSULATION ON WIRE TO IGNITE. FIRE SPREAD FROM #3 CUBICLE TO ADJACENT CUBICLES ON EACH SIDE BURNING MORE INSULATION ON #3 FD FAN BREAKER CUBICAL AND A3-A4 TIE BREAKER CUBICAL. EXTENSIVE DAMAGE WAS CAUSED TO CUBICLES. THE FIRE WAS EXTINGUISHED BY THE FIRE DIVISION. |
| **$Damage** | $150,000 |
| **Cause Code** | 1 |
| **Suppression Code** | 4 |
| **Material Ignited** | ELECTRICAL CABLE INSULATION |

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