# CURRENT RATEMAKING PROCEDURES IN BOILER AND MACHINERY INSURANCE

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## INTRODUCTION

The object of this paper is to provide a description of the basic mechanics and rationale involved in the development of Boiler and Machinery manual rates. In this vein, no attempt has been made to evaluate the described procedures. It is hoped that this paper presents an orderly approach to an understanding of the logic and considerations underlying the Boiler and Machinery ratemaking procedures.

A description of the coverage and calculation of the manual premium is provided initially to acquaint the reader with the utilization of the end products of a rate revision as well as the pecularities involved in the development of premium for this line of business. In the next section, a broad description of the type and form of statistics that are available to the ratemaker, as collected under the Boiler and Machinery Insurance Statistical Plan of the National Bureau of Casualty Underwriters, is provided. The remainder of the paper provides an explanation of an actual rate revision, with pertinent comments on recent innovations, where such are evident.

Since indirect damage coverages comprise approximately one third of the premium income for the Boiler and Machinery line, these are described in the same detail as that for the direct damage coverages.

## COVERAGE AND DEVELOPMENT OF PREMIUM

The Boiler and Machinery policy provides a two-fold benefit to the insured: (1) indemnification in case of accident to the insured object and (2) inspection and limited engineering service. The ratemaking scheme for this line of business is geared to the measurement of the potential costs of these benefits.

Essentially, the policy provides the following in the event of a defined accident to the insured object:

*Section I* – Indemnification for damage to the property of the insured up to the limit of the policy.

*Section II* – Payment of the reasonable extra cost of temporary repair and of expediting the repair of the damaged object, provided that the coverage under Section I has not exhausted the limit of the policy, up to $1,000.

*Section III* – Indemnification for damages to the property of a third party for which the insured is held liable, up to an amount equal to the remaining portion of the limit of the policy after coverage under the two preceding sections has been satisfied.

*Section IV* – If the policy limit has not been exhausted by the coverage under the preceding sections, indemnification for bodily injury to a third party for which the insured is held liable up to an amount equal to the unexhausted portion of the limit of the policy. This coverage is on an optional basis.

*Section V* – Defense against suits alleging that the insured is responsible for property damage or bodily injury to a third party under Sections III and IV. The amount available for this section is in addition to the limit per accident of the policy.

A number of indirect damage coverages are also available in the Boiler and Machinery line. The forms whose rates are provided currently on a manual basis are:

(1) *Use and Occupancy*

Two basic forms of Use and Occupancy insurance are used to cover Boiler and Machinery exposures:

(a) Valued Form: Wherein a daily indemnity is provided for the described premises which is the maximum amount payable for each day during which business is entirely prevented. If there is a partial prevention of business, only that proportion of the daily benefit is covered for which business was prevented. These benefits are payable until a stated net limit of loss is reached. There are several valued forms available which provide variations from the foregoing basic description to meet the peculiarities of the businesses to be insured or types of objects to be covered.

(b) Actual Loss Sustained Form – With or Without Specified Daily Indemnity: This form, when written with specified daily indemnity, provides similar coverage to that afforded by the valued form but differs in that the amount payable per day is not contingent upon the proportion of business prevented in the case of a partial prevention of business. This is always written on a coinsurance basis with a net limit of loss per accident. This form, because of its similarity to the valued forms which do not require coinsurance, has gradually fallen into disuse within the industry. The form which has no specified daily indemnity provides a limit of loss for

a particular premises, which is the maximum amount payable for the prevention of business resulting from one accident. A major factor in determining the limit of loss to be covered is the number of days for which the insured feels that indemnification is required; however, there is no limit on the number of days for which indemnification is available so long as the limit of loss has not been exhausted.

(2) *Outage*

In general, Use and Occupancy provides reimbursement to the insured for the profit prevented and the necessary continuing expenses when an accident has occurred to the insured object. Outage, on the other hand, indemnifies the insured for the additional cost incurred when other means, or less efficient objects, must be utilized in order to continue business when such accident has occurred. Outage coverage provides a specified hourly indemnity for each hour during which the function of the insured object is prevented due to accident. The acceptance of this indirect damage form has lessened appreciably in recent years.

(3) *Consequential Damage*

This coverage provides the insured with indemnification for actual loss to specified owned property, and also to that of others if legally liable, when such loss is due to spoilage from lack of power, light, heat, steam or refrigeration at specifically designated premises, caused by accident to a specified object whether the object is located on those premises or elsewhere.

It should be noted that Guide (a) rates are available for U and O forms which are written on a weekly or monthly indemnity basis.

## THE MAKEUP OF THE BOILER AND MACHINERY PREMIUM

In the development of the premium to be charged for the direct damage coverage of an object under a Boiler and Machinery policy, two basic elements must be determined: the object charge and location charge.

The object charge is a flat amount which varies for each type and size of object. This charge encompasses the cost of indemnification for loss including expediting expenses, and that part of the cost of an engineer's inspection which is peculiar to each type and size of object. In a general sense, the inspection costs that are contemplated in the object charge are those which an engineer incurs from the time he enters the premises where the object is located until he leaves and the writing of the necessary reports

in connection with such inspection. Most states and some municipalities require that certain types of boilers be certified as to their operating condition through an inspection by a licensed inspector. In general, all insurance boiler inspectors are licensed to perform this function. The expense of the issuance of a certification is also contemplated in the inspection expense attributable to the object charge.

The basic object charge is that for a $25,000 policy limit. For higher than a $25,000 limit, an excess limits factor is applied as a multiplier to the object charge. There are certain types of objects which are not considered to have a loss potential in excess of $25,000 regardless of size. The excess limits charge is not applicable to these object types. The excess limits factor varies only by the limit desired. It is possible to select limits lower than the $25,000 basic, but there is no credit given in the object charge due to the constant dollar cost element of an inspection which constitutes a major portion of this charge.

The location charge is also a flat amount and applies for each premises where the insured objects are located. A 40% discount is allowed for all locations over two which are situated within the boundaries of a single city or village. The predominant element of cost contemplated in this charge is the various expenses incurred by an engineer in traveling to and from the location where the insured object is situated. In addition, there is an excess loss allowance included in the location charge. Because of this, the charge varies directly with the limits selected. When the insured selects limits less than the $25,000 basic limit per object a reduced location charge is obtained and the allowance for excess limits losses is considered to be a credit.

If the insured elects to include bodily injury liability in the policy, a flat charge is levied which varies directly with the accident limit selected.

If the insured object is portable, a portable object charge is applied rather than a location charge. This charge, also a flat amount, is considerably less than the location charge, but no portable object or group of portable objects can be written without at least one location charge. As an example, if there were three portable objects to be insured, the one with the highest limits must take a location charge and the remaining two a portable object charge.

Exhibit I illustrates the table of these charges as they appear in the National Bureau of Casualty Underwriters rate manual. These charges are for a three year term as are all charges which appear in the manual.

In the development of the premium to be charged for the coverage of U. and O. and Outage under a Boiler and Machinery policy it is necessary to determine the applicable object group number, amount of daily indemnity, and the number of rating days. The manual rates are stated in terms of dollars charged per $1,000 of daily indemnity for a specified number of rating days.

Each insured size and type of object is categorized under a group number and suffix letter which encompasses all sizes and types of objects which have a common U. and O. hazard potential. If more than one object takes the same group number including the suffix letter, a single U. and O. charge is made for all of the objects. When more than one object is to be insured which have the same group number but differing suffix letters, the group number and suffix letter which produces the highest rate, assuming the exposure is the same for all objects in this group, is used in determining the charge to be made for that group of objects. Where more than one type of object is to be covered, a charge is made for each group number involved. In the rating of all U. and O. forms which have maximum daily indemnity, the maximum daily indemnity and net limit of loss are preselected and it is only necessary to divide the net limit of loss by the maximum daily benefit in order to calculate the number of rating days. This procedure applies generally to the valued forms and the Actual Loss Sustained – Maximum Daily Indemnity form. For the Actual Loss Sustained – No Specified Daily Indemnity form, the net limit of loss and number of rating days are pre-selected and it is only necessary to divide the net limit of loss by the number of rating days in order to calculate the daily indemnity for rating purposes. In the practical application of this technique, however, a different procedure is used. The limit of loss is selected and the rating daily indemnity calculated by dividing the annual value of the profit and continuing expenses by the average number of working days in a year and multiplying this result by the coinsurance percentage. The rating days are then calculated by dividing the limit of loss selected by the rating daily indemnity as determined. This form is usually written on a coinsurance basis. It is possible to conditionally suspend the coinsurance requirement through the use of a surcharge, but this suspension must be renewed annually.

A type of deductible device is also introduced in the U. and O. rating scheme which makes use of the concept of a "Specified Midnight" which is merely a determination by the insured of when the indemnity is to begin after an accident to the insured object has occurred. A dollar reduction per object group, which increases as the "Midnight" selected gets farther re-

moved from the day of the accident, is allowed from the rate charged had no specified midnight been selected. In all cases, the number of specified midnights must be added to the number of rating days which has been calculated in the determination of the number of rating days for rating purposes. The dollar allowance for a specified midnight is then deducted from the corresponding premium for that number of rating days. The charge thus determined is that for $1,000 of daily indemnity and must be multiplied by the ratio of the actual daily indemnity to $1,000 in order to reflect the proper premium for the daily indemnity anticipated in the policy.

When coinsurance is applicable, as in the case of both aforementioned actual loss sustained forms, a multiplier is applied to the premium thus developed. This multiplier varies inversely with the coinsurance percent selected by the insured.

Illustrations are provided in Exhibit II which show for the major form groups:

(a) the applicable group numbers for unfired vessels, (b) the applicable portions of the rate page for unfired vessels and (c) the pertinent co-insurance multipliers for all sizes and types of objects.

The premium to be charged for Outage insurance is obtained by applying a multiplier to the applicable object size and type valued form U. and O. rate for $1,000 of daily indemnity which takes into account the number of hours per day for rating purposes. The number of hours per day, for rating purposes, is calculated by dividing the limit per day by the hourly indemnity. This result is then divided by 1,000 and multiplied by the desired amount of hourly indemnity to develop the proper premium. A major difference between Outage and U. and O. in the development of premium is in the treatment of groups of objects. Several objects having the same group number have a single premium charge under the U. and O. form, but under the Outage form, each object incurs a premium charge regardless of the common group number. Exhibit III shows the current NBCU Outage multipliers.

In developing the premium charge for Consequential Damage, there are two major types of coverages to be considered; whether the property is: (a) insured solely while in storage dependent on cold or heat or (b) insured whether or not in storage. In addition to these determinants, the premium is dependent upon the desired limit of liability, the classification of the objects which are applicable, and the coinsurance basis. A charge is made for each classification type, regardless of the number of objects

involved in that classification. The premium is developed for each premises to be covered. A reproduction of the NBCU Consequential Damage Insurance Rate Table is shown in Exhibit IV.

## THE COLLECTING OF BOILER AND MACHINERY STATISTICS

The National Bureau of Casualty Underwriters is the sole statistical collection, as well as ratemaking, agent for Boiler and Machinery. All of the major writers of Boiler and Machinery insurance report their statistics to the National Bureau and utilize, in varying degrees, the rating output of this organization.

Under this extremely detailed statistical plan, the type of statistics reported to the Bureau can be segragated into three broad categories: premiums and exposures, losses, and inspection expense. These statistics are reported annually on a transaction basis by calendar year so as to comply with a calendar-accident year method of recording and compiling experience which will provide for the development of accident year incurred losses, calendar year earned premiums, and earned exposures.

### *Premiums and Exposures*

The unit of exposure utilized in Boiler & Machinery is the "object month" which is a specified object exposed for one month. Premiums and exposures are reported for each premium transaction by type and size of object. The object months are assigned to a calendar year in each transaction reported. In most instances, all of the premiums and exposures are written and reported on a three year basis; therefore, the exposures are reported as the number of months for which the policy is in force for each calendar year of the term of the policy. Where there is more than one object of the same type and size in a transaction, a summary is allowed with the exposures reported being the number of object months exposed during a calendar year times the number of objects along with the total written premium for these objects.

The type code is developed in such a way so as to segregate the amount of dollars that make up the components of the direct damage premiums (e.g. object charge, location charge and excess limits charge) and indirect damage premiums, as well as to designate through "special" type codes the actual debits or credits allowed under a filed individual risk rating rule, Special Multi-Peril policy, or any other rating vehicle which would produce premiums on other than a manual basis. The end result of this treatment of risk premium modifications in the type of object code is to have the

premiums for all real objects reported on a manual basis and still be able to balance, in total, to the actual written premiums.

The object size codes also serve several purposes aside from indicating the capacity of a specified object. For the location charge, portable object charge, and bodily injury liability charge, the limit per accident is identified. On U. and O., the group number applicable to the insured object is designated. All deductible business must be identified by specified codes in a Kind of Card designation. The reporting of the amount of the deductible (to the nearest $100) is provided for in a deductible amount code.

*Losses*

The losses are reported separately for those paid during the calendar year and those outstanding at the end of the calendar year. All losses are reported exclusive of loss adjustment expenses. As is applicable in the loss coding for any other line of business, the losses will be coded with the essential detail that was reported for the premium of the policy on which the loss was incurred, and associated with the object type and size code of the object the earliest failure of which caused the loss. The number of incurred losses is also reported, with an indirect coverage loss treated as another claim, separate and distinct from the direct damage loss.

*Inspection Cost*

Since engineering and inspection service is such an important part of Boiler and Machinery insurance and makes up such a large segment of the premium dollar, the plan provides for an extensive analysis of the total amount reported for each company in the Insurance Expense Exhibit, Part II, under Boiler and Machinery on lines 8, "Inspection Expenses Paid" and 9, "Boards, Bureaus and Associations Expenses Paid." This analysis gives due consideration to incurred inspection expense for direct and indirect coverages. On the direct damage coverages, it is necessary to record the actual number of inspection hours devoted to the various type and size of objects. These inspection hours shall "include only the time spent by the inspector in the plant inspecting objects of the type in question and discussing plant problems with respect to such objects."[1] On the basis of this record of hours spent, the dollars of inspection and boards and bureaus expenses are allocated to type of object.

[1] NBCU Boiler and Machinery Insurance Statistical Plan.

All of this data is reported to the NBCU separately for Continental U.S.A. (excluding Alaska), Alaska, Hawaii, and Puerto Rico. The only data furnished in the annual call for experience on a state by state basis is the total Boiler and Machinery experience for the calendar year of call. This report provides direct written premiums, losses paid during the year of call, and losses oustanding on December 31 of the year of call. These loss figures are further distributed to year of accident with each of the five previous years shown separately and all previous to that period shown in total. These statistics have not been used in the ratemaking procedure.

## CURRENT RATE REVIEW PROCEDURES

The Boiler and Machinery rating procedure is unusual in two respects: (a) the rates are developed from countrywide data and applied on a countrywide basis; and (b) inspection expenses receive the same rating treatment as incurred losses. The latest rate revision for Boiler and Machinery was accomplished in 1961. The relatively stable results of this line from year to year and the need for a sizeable volume of current experience so as to obtain fairly credible indications by type of object precludes the use of frequent rate revisions although an overall rate level review is usually made on an annual basis. Prior to the 1961 revision, various changes were made in 1955, 1952, and 1948. The revision effective May 1, 1961, aside from being the most current, was also in extensive revision and will serve as an illustration of the procedures followed in Boiler and Machinery ratemaking.

## REVISION OF THE OBJECT CHARGE

The general steps followed in the revision of the object charges are as follows:

(a) Establishment of an overall object rate level change: This is accomplished by comparing the overall indicated loss, loss adjustment, and inspection ratio to the expected loss, loss adjustment, and inspection ratio.

(b) Development of the object rate indicated percentage change: A modified pure premium approach is utilized in achieving the percentage change required in the present object charge for each object. The loss and loss adjustment and inspection pure premiums are compared to the present average object premium and, through the application of credibility, a formula loss, loss adjustment and inspection ratio indication is developed. This indication

is then balanced, for each object, to the overall rate level indications so as to approximate as closely as possible the overall rate level change for all of the objects combined.

(c) A major revision in the definition of accident, which produced a more liberal interpretation of the coverage, was taken into consideration in the 1961 rate revision, which necessitated an additional step in developing the percentage change in the object rate. Due to a lack of sufficient data to measure the value of this broadening of coverage statistically, flat percentage increases were developed on a judgment basis and applied to the loss portion of the indicated rate level change for each object type and size.

*Calculation of Indicated Object Rate Level Change*

In the development of the overall indicated object rate level change, the full coverage experience of all carriers writing Boiler and Machinery insurance in the continental United States for the three most current accident years 1956 through 1958 was utilized. The outline of the calculation utilizing this experience is shown in Exhibit V. In the calculation of the object rate earned premium on present rate level, there was no need to adjust the 1956-1958 premiums for a rate level change as there was none written at other than the present rate level. The 1955 rate revision affected only U. and O. rates; therefore, the object charge premiums were written at the rates developed in the 1952 revision. The earned premiums are calculated on the basis of the object months reported as exposures for the corresponding written premiums, which are assigned to specific calendar years under the Boiler & Machinery statistical plan. This, essentially, produces an earned premium calculated on a monthly basis. In this calculation, the number of object months, by object type, which were assigned to the review period of 1956-1958 were divided by the total number of object months in force to obtain the percentages which were earned. These percentages were applied to the corresponding written premium in force in order to calculate the earned premiums.

All premiums and exposures reported under this statistical plan are assigned a policy identification code, which is merely an indicator of the rate level at which they were written. All premiums which are written at the same rate level carry a common identification code. When it is necessary to calculate an earned premium on present rate level (i.e. the premiums of the experience period being written on various rate levels), to the earned object premiums which are indicated as being written on other

than the current rate level are applied the object rate adjustments, by object type, which have been effected from the time that these objects were written up to the time the revision is to be made. This adjusts these earned premiums to the current rate level and, by combining these with the earned premiums which are indicated as being written at the current rate level, the earned premium on present rate level is obtained. Since there are infrequent rate revisions in Boiler and Machinery, it is uncommon to find more than two policy identification codes involved in this calculation.

The incurred losses reported for that period were limited to $25,000 to produce basic limits loss experience. All loss adjustment expense, both allocated and unallocated, is included with the incurred losses. The inclusion of all loss adjustment expense was accomplished through the application of a 1.10 factor to the incurred losses. This factor was determined on the basis of a review of the expense experience, as reported in the Insurance Expense Exhibits of NBCU members, for Boiler and Machinery for calendar years 1957 through 1959. From this premium and loss data the indicated loss and loss adjustment ratio is calculated.

Once the indicated loss and loss adjustment ratio has been determined, it is necessary to measure the portion of the inspection cost which is included in the object charge. Appendix I outlines the calculation of the estimated dollars of inspection expense which is included in the object charge. This amount is compared to the present level earned object charge premiums in the calculation of the indicated inspection ratio. This indicated ratio is combined with that for loss and loss adjustment and an indicated loss and inspection ratio is obtained.

On the basis of the aforementioned review of the experience reported in the Insurance Expense Exhibit of NBCU member companies for calendar years 1957-1959, it was proposed that the following loss and expense provisions be considered as those included in the current Bureau manual rate prior to the application of any premium discount:

| | |
|---|---|
| Total production cost | 30.0 |
| General administration | 10.5 |
| Taxes, licenses and fees | 4.0 |
| Underwriting profit & contingencies | 5.0 |
| Total service and overhead excluding inspection and bureau expenses | 49.5 |
| Loss, loss adjustment, inspection, and bureau expense | 50.5 |

These expense allowances establish the expected loss, loss adjustment, and inspection ratio at .505. By comparing the loss and inspection ratio which was developed for the 1956-1958 accident year period to that expected, and subtracting unity, the indicated rate level percentage change is determined.

*Development of Object Rate Indicated Percentage Change*

This next step is, essentially, a calculation of the portion that each type of object contributes to the overall indicated rate level change. Due to the distribution of experience into these smaller parcels, the experience of the same carriers for the most current five accident year period, 1954 through 1958, was used in order to develop more meaningful indications for each type of object. The calculation is shown in Exhibit VI.

From the object month exposures reported for the 1954-1958 accident year period, the Number of Earned Objects, as shown in Column (2), is obtained by dividing, for each object, the total number of object months by 12, since the rates contemplated in this filing are based on an object year calculation.

The figures show in Column (3), Earned Premium at Present Average Rates, were developed in the manner described in determining the overall indicated rate level change. The earned premiums were calculated on the basis of the assignment of the earned exposures to calendar year. The premiums written at other than present rates for each object were earmarked by the applicable policy identification code and adjusted to the present rate level. The earned premium at present average rates is the combination of the adjusted earned premiums and those earned premiums written at the present rate level. It should be noted here that the term "present average rate" is applicable because the indications are obtained by object type, with rates being published by both type and size of object. In general, the object indicated rate level change is applied uniformly to the existing rate for all sizes within an object type. Column (4) of Exhibit VI is merely the incurred losses limited to $25,000, adjusted by 1.10 to include all loss adjustment expense and divided by the number of earned objects. Column (5), Loss and Loss Adjustment Pure Premium on Proposed Level, is calculated by applying to the actual pure premium for each object, Column (4), the ratio of the indicated loss and loss adjustment ratio (.269), as determined in the overall rate level change calculation (Exhibit V), which was based upon the experience of three accident years (1956-1958), to the loss ratio for all objects combined for the five accident year period (1954-1958). The inspection data utilized

in this filing is based upon the four latest calendar years (1955-1958) inspection costs per object as reported by all carriers under the Boiler and Machinery Insurance statistical plan.[2] The actual inspection pure premium was calculated by dividing the inspection cost per type of object class for calendar years 1955-1958, which is discounted by 12.83% to exclude the inspection costs included in the Location and Portable Object charges (see Appendix I), by the earned number of objects for the same period. The actual inspection pure premium was developed to a proposed level in Column (7) by applying to the inspection pure premium of each object a factor developed from the following ratio:

$$\frac{\text{Indicated inspection ratio (Line 5, Exhibit V)}}{\Sigma[\text{Col. (2)} \times \text{Col. (6)}] \div \text{Total Col. (3)}}$$

The application of this ratio places the inspection costs developed from the 1955-1958 calendar year data on a comparable basis to the loss and loss adjustment data.

The Present Average Rate, Column (8), to which the proposed loss and loss adjustment and inspection pure premium is to be compared is merely the premium at present average rates divided by the number of earned objects for each type of object class. The comparison of these figures is shown in Column (9).

The portion of this comparison which is to be utilized in determining the indicated rate level change for an object is dependent upon the credibility assigned to the experience of the object. This measure of reliance, in the Boiler and Machinery rating procedure, is based upon the five year earned premium on present rate level of the object class. The percent of reliance is shown in the Credibility Table of Exhibit VII.

The rationale behind the credibility table used for Boiler and Machinery is essentially the same as that for the credibility table which has been used in assigning reliance to class indications in fire insurance.[3] The requirement of $7,000,000 of five calendar years of earned premium at present rate level for full credibility was established much the same as the $5,000,000 was for fire, on a judgment basis. The premium requirements for less than full credibility are calculated using the common partial credibility formula $Z^2 = \frac{P}{N}$ where P is the premium for the object type and

[2] Due to a revision in the requirements for the filing of expenses in the Boiler and Machinery Insurance statistical plan which was effective in 1955, only the four latest calendar years of data were on a comparable basis so as to be usable in the revision.

[3] "Ratemaking for Fire Insurance"—Joseph J. McGrath, *PCAS* Vol. XLV.

N is $7,000,000, or the premium required for 100% credibility. As can be seen, this formula is based upon the square root rule of weighting utilizing the concept that the probable error of an experience average varies inversely with the square root of the volume.

The Formula Loss and Inspection Ratio, Column (11), is calculated for each object by weighting the developed loss and inspection ratio on proposed level with the credibility percentage warranted by the object class earned premiums, and weighting the overall indicated loss and inspection ratio (Line 6, Exhibit V) with the complement of that credibility percentage and unity. Column (12) shows the relationship of each of the object formula loss and inspection ratios to that for all objects combined (.593) for this body of experience. This shows the relative difference in magnitude of the individual object rate from that for all objects combined.[4] Once the relationship of each object to the average of all objects has been established, the overall rate level change can be apportioned to each object according to this relationship, thereby producing the Formula Rate Level Change as shown in Column (13).

In all cases, the Formula Rate Level Change by object class was limited (in this instance to a 25% increase for an object class), which is a generally accepted rating concept in all lines of insurance so as to maintain a degree of stability in the rating structure. This limitation on the increase to 25%, when these indicated changes were applied to the earned premium of each object type, produced an overall increase of 12.4% which was short of the overall 17.4% proposed increase. In the calculation of the Indicated Rate Level Change per object class, the balancing factor of 1.1041 was applied to the rate level factor of 1.174, for classes unaffected by the limitation, to produce an indicated rate level factor of 1.296 to be applied to the corresponding ratios of Column (12). This enabled the indications of a class to be limited to +25%, by increasing the Indicated Rate Level Change on the classes which were unaffected by the limitation by 10.41%, and achieve the 17.4% proposed increase overall.

*Incorporation of Adjustment of Object Loss and Loss Adjustment Charge for Broadening of the Definition of Accident*

Prior to the 1961 revision, there were two definitions of accident for Boilers, one being referred to as Limited coverage and the other Broad

[4] It should be noted that this procedure is similar to that employed in the ratemaking procedure for automobile liability in the distribution of the statewide rate level change to territory as shown by Mr. Philipp K. Stern in "Ratemaking Procedures for Automobile Liability Insurance," *PCAS* Vol. LII.

coverage. Under the Limited definition, coverage was provided for loss from tearing caused by pressure of steam or water therein. In essence, just rupturing or bursting was covered. The Broad definition covered the same hazards as that provided by the Limited definition but, in addition, covered sudden and accidental crushing inward, cracking of a cast metal part, and bulging or burning caused by pressure of steam or water, or resulting from a deficiency of steam or water. The definition of accident for Machinery covered the principal hazards of sudden and accidental breaking into two or more separate parts, both mechanical and electrical burning out and deforming of any rod or shaft.

In the revised definition of accident, the Limited Boiler coverage was left intact, hence no additional charge was utilized. For the Broad coverage, however, the definition was revised to insure against "the hazard of loss from breakdown, with the requirement of manifestation by physical damage necessitating repair or replacement."[5] This connotation extended the definition to include many externally caused hazards. For Machinery objects a similar extension of the definition of accident was made, dependent upon the type of object and the hazards peculiar to it. Essentially, the new definition provides coverage for the wide general area of mechanical or electrical breakdown of objects, the degree of broadening of interpretation being dependent upon the object.

It should be noted that there was also a revision of the definition of objects, but this did not create any change in the hazards to be measured, hence no adjustment in the rates were required.

Exhibit VIII illustrates the development of a composite of the percentage change in the object rate due to experience indications and to the revised definition of accident by type of object. Column (2) shows the object rate indicated percentage change from Column (14) of Exhibit VI. Column (3) shows the additional percent of loss hazard which, in the judgment of the underwriters of several companies, is required by this broadening of the definition. These percents were applied to the loss portion of the Present Average Rate in Exhibit VI, Column (8), which was adjusted by the indicated rate level change of Column (14), to produce the percentage changes in Column (4). In all cases, the composite rate level change has been limited to +33.3% in order to forestall excessive fluctuation in the rates for some objects.

[5] NBCU Manual of Boiler and Machinery Insurance, p. 301.

## REVISION OF THE EXCESS LIMITS, LOCATION, PORTABLE OBJECT AND BODILY INJURY CHARGES

On the basis of a review of the experience of all carriers writing Boiler and Machinery insurance in the continental United States for accident years 1956 through 1958 separately, and in combination, as shown in Exhibit IX, it was proposed that a 10% reduction be reflected in the excess limits, location, portable object, and bodily injury liability premium level. The Earned Premium on Present Rate Level, Column (2), for these components of the direct damage premium was developed from the written premium reported to the National Bureau, in the same manner as that described in the calculation of the overall object rate level change. The incurred losses in Column (3) include the excess portion over $25,000 that was excluded from the object charge calculation plus all bodily injury losses. The bodily injury losses and excess losses include loss adjustment expense through the application of a 1.10 loss adjustment factor as proposed in the filing.

The determination of the dollars of Inspection Expense Not Included in the Object Rates, Column (4), was accomplished in the procedure outlined in Appendix I. The portion of expenses attributable to the individual accident years was calculated by taking 12.83%, the overall developed percent of inspection pure premium in the location and portable object charges for the three accident years combined, of the inspection expenses reported to the National Bureau for each of those accident years. The total for the combined accident years is also shown on line 10, Exhibit I of Appendix I. By combining the incurred loss, loss adjustment, and inspection dollars, and relating them to the earned premium at present rates, the loss and inspection ratio for these components of the direct damage rate is determined as shown in Column (5). These ratios were compared to those anticipated for these charges (.505), and, on the basis of this comparison, the 10% reduction was proposed. This reduction was accomplished through an adjustment of the rates published in the existing tables so as to produce the tables shown in Exhibit I, Sheet 2.

## REVISION OF USE AND OCCUPANCY RATES

A procedure similar to that utilized in developing the object rate indicated percentage change is followed in developing the proposed rate level change by rating group, the major difference being the initial calculation of loss and loss adjustment ratios, instead of pure premiums, for each group. The experience of all forms for accident years 1954 through 1958, as shown in Exhibit X, indicated an overall loss ratio of 32.5%. On the basis of this favorable loss ratio, a 10% reduction was proposed in the

U. and O. premium level. An illustration of the distribution of this overall reduction to rating group is provided in Exhibit XI.

The premiums and losses of the five calendar-accident years 1953 through 1957, being the most current U. and O. experience available by rating group, were used to determine these indications. The earned premiums of Column (2) were adjusted to present level in the same manner as previously described. The incurred losses were loaded by the 1.10 factor for the inclusion of loss adjustment expense and the loss and loss adjustment ratios on present level calculated as shown in Column (5). The credibility table utilized in the direct damage portion of this revision was applied here, with the amount of reliance accorded to the rating group indications being dependent upon the five calendar year earned premiums at present rates.

The weighting process used in the development of the formula loss and loss adjustment ratio on present level is similar to that used in the direct damage calculations in that the indicated loss ratio was weighted with the accorded credibility percentage and the overall loss ratio weighted with the complement of that percentage and unity. This produced the results shown in Column (7). The formula loss and loss adjustment ratio on present level for each group was then divided by the total U. and O. formula loss and loss adjustment ratio (.282), which is the sum of the individual ratios of Column (7) applied to the corresponding premium of Column (2) and divided by the sum of Column (2), to determine the distribution of the overall −10% rate level change to rating group, much the same as was done in the direct damage rate revision. These results are shown in Column (8).

The Formula Rate Level Change is shown in Column (9) and is merely the application of the 10% reduction to the proportion each formula loss and loss adjustment ratio bears to the total. In the determination of the Proposed Rate Level Change in Column (10) a maximum and minimum limit of +25% and −20%, respectively, was imposed.

These limitations do not allow the achievement of the required −10% overall, and if there were no attempt made to achieve this reduction, the resulting effect would be but a 8.0% reduction when the rate level factor is applied to the earned premium of each class. A balancing factor of .8452 was introduced to be applied to the ratios derived in Column (7) for the classes unaffected by the limitations. This was calculated by multiplying the rate level factor of .900 by .8452 to produce a rate level factor of .7607 which, when applied to the corresponding ratios in Column (8), pro-

duced the Proposed Rate Level Changes of Column (10) within the limitations described. These proposed rate level changes were, for the most part, applied to the rates in the existing rate schedules to produce the revised changes.

## OUTAGE AND CONSEQUENTIAL DAMAGE RATES

There have been no revisions made in the Outage multipliers or Consequential Damage rates during the past twenty years. Any revision in the U. and O. valued form rates, of course, would affect the Outage rate level directly since the Outage premiums are developed through the application of a multiplier to the U. and O. valued form rates.

The loss ratio results for both Outage and Consequential Damage have been consistently stable over the years, thereby dispensing with the need for a revision. It is extremely likely that, if a revision were to be made, it would be accomplished by a broad comparison of the indicated loss ratios with those expected, much the same as was done in the 1961 revision of U. and O. rates, with a flat percentage change effected.

## CONCLUSION

Because the Boiler and Machinery Insurance Statistical Plan provides for premiums to be reported on a manual basis, there is no need to include in the ratemaking procedure a calculation to compensate for the off-balance condition that is created by the application of the various rating plans available for risks of size. Only manual, full coverage, premiums are utilized in the Boiler and Machinery ratemaking procedure.

As can be seen from the foregoing calculation of the object rate indicated percentage change, despite the use of pure premiums, this can hardly be considered a rating method utilizing a pure premium approach. These pure premiums are used to produce a loss and inspection ratio on proposed level, which, in the end result, does not produce a rate but merely an indicated change to be applied to existing rates.

A review of the type and form of the current statistics being produced for the Boiler and Machinery ratemaker indicates that there should be few changes in the future from the procedure used in the 1961 revision. Underwriting and engineering judgment should still play an important role in dealing with the changes that cannot be measured statistically as well as tempering the degree to which statistical indications should be followed. This will be necessary so long as the distribution of experience to the many object types is maintained and the volume of exposures expand at but a modest pace.

National Bureau of
Casualty Underwriters

Exhibit I
Sheet 1

EXCESS LIMITS APPLY

UNFIRED VESSELS - TYPES 1, 2, 3 and 4

Type 1. All Unfired Vessels except Types 2, 3, 4 and 5

Type 2. Rendering Tanks
Soap Kettles
Rotating Vessels not in Types 3 and 4

Type 3. Acid Accumulators
Bleachers and Kiers
Brick Hardening Cylinders
Creosoting Cylinders
Diffusers
Digesters

Type 4. Vessels in which any of the following processes is actively carried on:

| | |
|---|---|
| Acetylation | Extraction (other than by Water) |
| Alkylation | Friedel-Crafts Reaction |
| Amidation | Halogenation |
| Amination | Hydrogenation |
| Cracking | Nitration |
| Depolymerization | Oxidation |
| Diazotization | Polymerization |
| Distillation (other than of Water) | Reduction |
| Esterification (except Soap-Making) | Sulphonation |

Object Rates

| Size (Sq. Ft.) | Type 1 | Type 2 | Type 3 | Type 4 |
|---|---|---|---|---|
| 5 | $ 9 | $ 15 | $ 15 | $ 30 |
| 10 | 15 | 20 | 20 | 41 |
| 20 | 20 | 28 | 28 | 56 |
| 30 | 25 | 35 | 35 | 71 |
| 50 | 35 | 50 | 50 | 102 |
| 75 | 42 | 61 | 61 | 122 |
| 100 | 49 | 71 | 71 | 144 |
| 150 | 63 | 91 | 91 | 183 |
| 200 | 75 | 108 | 108 | 217 |
| 250 | 87 | 124 | 124 | 251 |
| 300 | 97 | 139 | 139 | 280 |
| 350 | 107 | 152 | 152 | 307 |
| 400 | 115 | 165 | 165 | 334 |
| 450 | 123 | 177 | 177 | 358 |
| 500 | 131 | 188 | 188 | 380 |
| 600 | 145 | 209 | 209 | 422 |
| 700 | 159 | 229 | 229 | 461 |
| 800 | 173 | 248 | 248 | 500 |
| 900 | 186 | 267 | 267 | 539 |
| 1,000 | 196 | 284 | 284 | 573 |
| Each add'l. 100 Sq. Ft. or Fraction thereof | $10 | $14 | $14 | $29 |

U. & O. Group No. (4a) — U. & O. Group - See Footnote* — U. & O. Group No. (5) — U. & O. Group No. (5)

*Use and Occupancy Group (4c) is applicable to Rotating Vessels forming a part of machines for manufacturing, processing or finishing paper or pulp except Rotating Vessels in types 3 and 4. Group (4b) is applicable to all other Type 2 objects.

Note: For Electric Steam Generators and Electric Dowtherm (or Diphenyl) Boilers or Vaporizers add $6 to the rates shown for Type 1 Objects.

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Exhibit I
Sheet 2

BOILER AND MACHINERY INSURANCE
1961 REVISION OF DIRECT DAMAGE RATES
PROPOSED EXCESS LIMIT FACTORS, LOCATION CHARGES, BODILY INJURY
LIABILITY CHARGES AND PORTABLE OBJECT CHARGES

| Limit per Accident | Excess Limit Factor | Each Location | | Each Portable Object | | Limit per Accident |
|---|---|---|---|---|---|---|
| | | Location Charge | Bodily Injury Liab. Charge | Portable Object Charge | Bodily Injury Liab. Charge | |
| $ 25,000 | 1.00 | $ 28 | $ 1 | $12 | $1 | $ 25,000 |
| 30,000 | 1.02 | 31 | 2 | 13 | 1 | 30,000 |
| 40,000 | 1.03 | 35 | 3 | 14 | 1 | 40,000 |
| 50,000 | 1.04 | 39 | 4 | 15 | 1 | 50,000 |
| 60,000 | 1.04 | 43 | 5 | 16 | 1 | 60,000 |
| 75,000 | 1.05 | 49 | 6 | 17 | 1 | 75,000 |
| 100,000 | 1.06 | 56 | 7 | 18 | 1 | 100,000 |
| 150,000 | 1.07 | 68 | 9 | 19 | 1 | 150,000 |
| 200,000 | 1.08 | 80 | 11 | 20 | 1 | 200,000 |
| 250,000 | 1.08 | 92 | 12 | 21 | 1 | 250,000 |
| 300,000 | 1.09 | 104 | 13 | 22 | 1 | 300,000 |
| 400,000 | 1.09 | 126 | 15 | 23 | 1 | 400,000 |
| 500,000 | 1.10 | 148 | 17 | 24 | 1 | 500,000 |
| 750,000 | 1.11 | 200 | 20 | 25 | 1 | 750,000 |
| 1,000,000 | 1.12 | 250 | 20 | 26 | 1 | 1,000,000 |
| 1,250,000 | 1.13 | 300 | 20 | 27 | 1 | 1,250,000 |
| 1,500,000 | 1.14 | 350 | 20 | 28 | 1 | 1,500,000 |
| 1,750,000 | 1.15 | 400 | 20 | 29 | 1 | 1,750,000 |
| 2,000,000 | 1.16 | 450 | 20 | 30 | 1 | 2,000,000 |
| Each Add'l. $500,000 or Fraction thereof | .01 | $100 | .. | $2 | .. | Each Add'l. $500,000 or Fraction thereof |

For an intermediate Limit per Accident not shown above, use the next higher amount.

Sub-Basic Limits

Direct Damage Coverage may be written for limits lower than the basic limit of $25,000 per accident. The limits and applicable charges are as follows:

| Limit per Accident | Excess Limit Factor | Each Location | | Each Portable Object | | Limit per Accident |
|---|---|---|---|---|---|---|
| | | Location Charge | Bodily Injury Liab. Charge | Portable Object Charge | Bodily Injury Liab. Charge | |
| $ 5,000 | 1.00 | $15 | $1 | $ 7 | $1 | $ 5,000 |
| 10,000 | 1.00 | 18 | 1 | 9 | 1 | 10,000 |
| 15,000 | 1.00 | 22 | 1 | 10 | 1 | 15,000 |
| 20,000 | 1.00 | 25 | 1 | 11 | 1 | 20,000 |

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USE AND OCCUPANCY INSURANCE
VALUED - VALUED RATIO
ACTUAL LOSS SUSTAINED WITH DAILY INDEMNITY
INDEX TO RATING GROUPS

Exhibit II
Sheet 1

Boilers and Pressure Vessels

| Description | Group Numbers: Limited Coverage | Group Numbers: Broad Coverage | Group Numbers: Add for Furnace Explosion Coverage |
|---|---|---|---|
| Fire Tube Boilers | | | |
| Oil or Gas Drilling Boilers | 1b | 1h | 3a |
| Track Locomotive Boilers | 1b | 1h | 3a |
| All Other Boilers | | | |
| Steam-15 lbs. and less incl. Hot Water Heating and Hot Water Supply Boilers | 1a | 1g | 3a |
| Steam-over 15 lbs. | 1b | 1h | 3a |
| Water Tube Boilers | | | |
| 4,000 sq. ft. and less | | | |
| Steam-15 lbs. and less incl. Hot Water Heating and Hot Water Supply Boilers | 1a | 1g | 3a |
| Steam-over 15 lbs. | 1b | 1h | 3a |
| 4,001-10,000 Sq. Ft. | 1c | 1i | 3b |
| 10,001-20,000 Sq. Ft. | 1d | 1j | 3c |
| 20,001-30,000 Sq. Ft. | 1e | 1k | 3d |
| Over 30,000 Sq. Ft. | 1f | 1m | 3e |
| Cast Iron Boilers | 1a | 1g | 3a |
| Fired Vessels - Not Otherwise Classified | | | |
| Gas-Fired Radiators | 1a | 1g | 3a |
| Economizers (except any steel economizer used solely with a Boiler) | 1c | 1i | 3b |
| Coil or Storage Water Heaters | 1a | 1g | 3a |
| All Others | | | |
| Steam or Water | 2a | 2c | 3a |
| Except Steam or Water | 2b | 2d | 3a |

| Description | Group Numbers |
|---|---|
| Unfired Vessels | |
| Type 1 | 4a |
| Type 2 | |
| Rotating Vessels forming a part of machines for manufacturing, processing or finishing paper or pulp except Rotating Vessels in Types 3 and 4 | 4c |
| All Other Type 2 vessels | 4b |
| Types 3 and 4 | 5 |
| Type 5 | 4a |

National Bureau of
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Exhibit II
Sheet 2

USE AND OCCUPANCY INSURANCE RATE TABLE

VALUED - VALUED RATIO - ACTUAL LOSS SUSTAINED WITH DAILY INDEMNITY

Proposed Rates per $1,000 of Daily Indemnity

| Number of Rating Days | Group Numbers | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3a | 3b | 3c | 3d | 3e | 4a | 4b | 4c | 5 | 6 |
| 10 | $ 61 | $ 92 | $122 | $153 | $183 | $ 29 | $ 64 | $100 | $118 | $ 54 |
| 15 | 67 | 100 | 134 | 167 | 200 | 31 | 71 | 113 | 133 | 61 |
| 20 | 70 | 105 | 141 | 175 | 210 | 34 | 76 | 120 | 142 | 65 |
| 25 | 73 | 110 | 147 | 183 | 220 | 36 | 81 | 128 | 151 | 69 |
| 35 | 77 | 117 | 155 | 194 | 232 | 39 | 88 | 138 | 162 | 75 |
| 50 | 82 | 124 | 165 | 206 | 247 | 43 | 94 | 148 | 175 | 80 |
| 75 | 88 | 132 | 176 | 220 | 264 | 46 | 103 | 160 | 189 | 87 |
| 100 | 92 | 139 | 184 | 231 | 276 | 48 | 108 | 169 | 200 | 91 |
| 125 | 95 | 143 | 189 | 237 | 284 | 50 | 112 | 175 | 208 | 95 |
| 150 | 97 | 146 | 194 | 243 | 291 | 52 | 115 | 181 | 214 | 98 |
| 175 | 99 | 149 | 199 | 249 | 298 | 53 | 118 | 185 | 220 | 101 |
| 200 | 101 | 152 | 202 | 253 | 303 | 54 | 121 | 189 | 225 | 103 |
| 225 | 103 | 154 | 205 | 257 | 308 | 55 | 123 | 193 | 229 | 105 |
| 250 | 104 | 156 | 208 | 260 | 313 | 56 | 125 | 196 | 233 | 107 |
| 275 | 105 | 158 | 210 | 263 | 317 | 57 | 127 | 199 | 237 | 109 |
| 300 | 106 | 160 | 212 | 266 | 320 | 58 | 129 | 202 | 241 | 110 |
| 325 | 107 | 162 | 214 | 269 | 323 | 59 | 131 | 205 | 244 | 111 |
| 350 | 108 | 163 | 216 | 271 | 326 | 60 | 132 | 207 | 247 | 112 |
| 375 | 109 | 164 | 218 | 273 | 328 | 61 | 133 | 209 | 250 | 113 |
| 400 | 110 | 165 | 220 | 275 | 330 | 62 | 134 | 211 | 253 | 114 |
| Each Add'l. 25 Days or Fraction thereof . . . | $ 1 | $ 1 | $ 2 | $ 2 | $ 2 | $ 1 | $ 1 | $ 2 | $ 2 | $ 1 |

For any Intermediate Number of Rating Days, not shown in the above Table, use the Rate for the next higher Number of Rating Days shown.

Reduction for Specified Midnight Coverage

| Midnight | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1st | $16 | $23 | $31 | $38 | $46 | $ 5 | $10 | $16 | $ 19 | $ 9 |
| 2nd | 30 | 45 | 59 | 74 | 89 | 11 | 25 | 39 | 46 | 21 |
| 3rd | 37 | 57 | 75 | 94 | 112 | 15 | 34 | 53 | 62 | 29 |
| 4th | 43 | 64 | 86 | 107 | 129 | 18 | 40 | 63 | 75 | 34 |
| 5th | 47 | 70 | 94 | 117 | 140 | 21 | 45 | 71 | 84 | 39 |
| 6th | 50 | 74 | 100 | 125 | 149 | 23 | 50 | 78 | 92 | 42 |
| 7th | 52 | 78 | 105 | 131 | 157 | 25 | 53 | 83 | 98 | 45 |
| 8th | 54 | 82 | 109 | 136 | 163 | 26 | 56 | 88 | 103 | 48 |
| 9th | 56 | 85 | 113 | 141 | 169 | 27 | 58 | 92 | 108 | 50 |
| 10th | 58 | 87 | 116 | 145 | 174 | 28 | 60 | 95 | 112 | 51 |
| Any Other Midnight | Select the amount shown for the Number of Rating Days corresponding to the desired Specified Midnight, using the next lower Number of Rating Days for any Intermediate Number of Days. | | | | | | | | | |

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Exhibit II
Sheet 3

ACTUAL LOSS SUSTAINED
USE AND OCCUPANCY INSURANCE
WITHOUT A SPECIFIED DAILY INDEMNITY
INDEX TO RATING GROUPS

Boilers and Pressure Vessels

| Description | Group Numbers: Limited Coverage | Broad Coverage | Add for Furnace Explosion Coverage |
|---|---|---|---|
| Fire Tube Boilers | | | |
| Oil or Gas Drilling Boilers | 101b | 101h | 103a |
| Track Locomotive Boilers | 101b | 101h | 103a |
| All Other Boilers | | | |
| Steam-15 lbs. and less incl. Hot Water Heating and Hot Water Supply Boilers | 101a | 101g | 103a |
| Steam-over 15 lbs. | 101b | 101h | 103a |
| Water Tube Boilers | | | |
| 4,000 Sq. Ft. and less | | | |
| Steam-15 lbs. and less incl. Hot Water Heating and Hot Water Supply Boilers | 101a | 101g | 103a |
| Steam-over 15 lbs. | 101b | 101h | 103a |
| 4,001-10,000 Sq. Ft. | 101c | 101i | 103b |
| 10,001-20,000 Sq. Ft. | 101d | 101j | 103c |
| 20,001-30,000 Sq. Ft. | 101e | 101k | 103d |
| Over 30,000 Sq. Ft. | 101f | 101m | 103e |
| Cast Iron Boilers | 101a | 101g | 103a |
| Fired Vessels - Not Otherwise Classified | | | |
| Gas-Fired Radiators | 101a | 101g | 103a |
| Economizers (except any steel economizer used solely with a Boiler) | 101c | 101i | 103b |
| Coil or Storage Water Heaters | 101a | 101g | 103a |
| All Others | | | |
| Steam or Water | 102a | 102c | 103a |
| Except Steam or Water | 102b | 102d | 103a |

| Description | Group Numbers |
|---|---|
| Unfired Vessels | |
| Type 1 | 104a |
| Type 2 | |
| Rotating Vessels forming a part of machines for manufacturing, processing or finishing paper or pulp except Rotating Vessels in Types 3 and 4 | 104c |
| All other Type 2 vessels | 104b |
| Types 3 and 4 | 105 |
| Type 5 | 104a |

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Exhibit II
Sheet 4

ACTUAL LOSS SUSTAINED
USE AND OCCUPANCY INSURANCE
WITHOUT A SPECIFIED DAILY INDEMNITY

PROPOSED RATE TABLE

Rates per $1,000 of Daily Indemnity

| Number of Rating Days | Group Numbers | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 103a | 103b | 103c | 103d | 103e | 104a | 104b | 104c | 105 | 106 |
| 1 | $ 41 | $ 61 | $ 81 | $101 | $122 | $ 10 | $ 26 | $ 41 | $ 49 | $ 22 |
| 2 | 53 | 79 | 105 | 132 | 158 | 17 | 44 | 69 | 81 | 37 |
| 3 | 60 | 90 | 120 | 150 | 179 | 21 | 54 | 85 | 101 | 40 |
| 4 | 65 | 97 | 130 | 162 | 195 | 24 | 62 | 97 | 114 | 52 |
| 5 | 69 | 103 | 138 | 172 | 206 | 26 | 68 | 105 | 125 | 57 |
| 6 | 72 | 108 | 144 | 180 | 216 | 28 | 72 | 113 | 133 | 61 |
| 7 | 75 | 112 | 149 | 187 | 224 | 30 | 76 | 119 | 141 | 65 |
| 8 | 77 | 116 | 154 | 193 | 231 | 31 | 80 | 124 | 147 | 68 |
| 9 | 79 | 119 | 158 | 198 | 237 | 32 | 83 | 129 | 153 | 70 |
| 10 | 81 | 122 | 162 | 203 | 243 | 33 | 85 | 133 | 158 | 72 |
| 15 | 88 | 132 | 176 | 220 | 264 | 37 | 96 | 149 | 177 | 81 |
| 20 | 93 | 140 | 186 | 233 | 280 | 40 | 103 | 161 | 190 | 87 |
| 25 | 97 | 146 | 194 | 243 | 291 | 42 | 109 | 170 | 201 | 92 |
| 35 | 103 | 155 | 206 | 258 | 309 | 46 | 117 | 183 | 217 | 99 |
| 50 | 109 | 164 | 219 | 273 | 328 | 49 | 126 | 197 | 234 | 107 |
| 75 | 116 | 175 | 233 | 291 | 349 | 53 | 137 | 214 | 253 | 116 |
| 100 | 122 | 182 | 243 | 304 | 365 | 56 | 144 | 225 | 266 | 122 |
| 125 | 125 | 188 | 251 | 314 | 376 | 58 | 150 | 234 | 277 | 127 |
| 150 | 128 | 193 | 257 | 322 | 386 | 60 | 155 | 241 | 285 | 131 |
| 175 | 131 | 197 | 262 | 328 | 394 | 62 | 158 | 247 | 293 | 134 |
| 200 | 134 | 201 | 267 | 334 | 401 | 63 | 162 | 253 | 299 | 137 |
| 225 | 136 | 204 | 272 | 339 | 407 | 64 | 165 | 258 | 305 | 140 |
| 250 | 138 | 207 | 276 | 344 | 413 | 65 | 168 | 262 | 310 | 142 |
| 275 | 140 | 209 | 279 | 348 | 418 | 66 | 170 | 266 | 314 | 144 |
| 300 | 142 | 211 | 282 | 352 | 423 | 67 | 172 | 269 | 318 | 146 |
| 325 | 143 | 213 | 285 | 356 | 427 | 68 | 174 | 272 | 322 | 148 |
| 350 | 144 | 215 | 288 | 359 | 431 | 69 | 176 | 275 | 326 | 150 |
| 375 | 145 | 217 | 290 | 362 | 435 | 70 | 178 | 278 | 329 | 151 |
| 400 | 146 | 219 | 292 | 365 | 438 | 71 | 180 | 280 | 332 | 152 |
| Each Add'l. 25 Days or Fraction thereof | $ 1 | $ 2 | $ 2 | $ 3 | $ 3 | $ 1 | $ 2 | $ 2 | $ 3 | $ 1 |

For any intermediate Number of Rating Days, not shown in the above Table, use the Rate for the next higher Number of Rating Days shown.

Reduction for Specified Midnight Coverage

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1st Midnight | $21 | $31 | $41 | $51 | $61 | $ 5 | $13 | $21 | $25 | $11 |
| 2nd Midnight | 40 | 59 | 79 | 99 | 119 | 13 | 33 | 52 | 61 | 28 |
| 3rd Midnight | 54 | 81 | 108 | 135 | 161 | 19 | 49 | 77 | 91 | 36 |
| Any Other Midnight | Select the amount shown for the Number of Rating Days corresponding to the desired Specified Midnight, using the next lower Number of Rating Days for any intermediate Number of Days. | | | | | | | | | |

Exhibit II
Sheet 5

Use and Occupancy Insurance
Coinsurance Multipliers

| Coinsurance Percentage | Valued Ratio and Actual Loss Sustained - Maximum Daily Indemnity | Actual Loss Sustained - No Specified Daily Indemnity |
|---|---|---|
| 100% | 1.00 | 1.05 |
| 90 | 1.05 | 1.09 |
| 80 | 1.10 | 1.13 |
| 70 | 1.15 | 1.17 |
| 50 | 1.25 | 1.25 |
| 35 | 1.40 | 1.40 |
| 25 | 1.50 | 1.50 |

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Exhibit III

TABLE OF OUTAGE MULTIPLIERS

| No. of Hours per Day | Multi-plier | No. of Hours per Day | Multi-plier | No. of Hours per Day | Multi-plier |
|---|---|---|---|---|---|
| 1 | 10 | 9 | 14 | 17 | 28 |
| 2 | 10 | 10 | 16 | 18 | 29 |
| 3 | 11 | 11 | 18 | 19 | 31 |
| 4 | 11 | 12 | 19 | 20 | 33 |
| 5 | 12 | 13 | 21 | 21 | 34 |
| 6 | 12 | 14 | 23 | 22 | 36 |
| 7 | 13 | 15 | 24 | 23 | 38 |
| 8 | 13 | 16 | 26 | 24 | 39 |

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Exhibit IV

CONSEQUENTIAL DAMAGE INSURANCE RATE TABLE

Rates per $1,000 of Insurance

| Class | Classification(**) | Coinsurance Basis | | | No Coinsurance |
|---|---|---|---|---|---|
| | | 80% | 50% | 25% | |
| Property Insured Solely While in Storage Dependent Upon Cold or Heat | | | | | |
| 1 | Boilers and Fired Vessels (Limited Coverage) listed on pages 102-109 Objects listed on pages 112-121... (See Note Below) | $4 | $5 | $8 | $12 |
| 2 | Boilers and Fired Vessels (Broad Coverage) listed on pages 102-109, with or without Objects listed on pages 112-121..... | 8 | 10 | 16 | 24 |
| 3 | *Objects listed on pages 130-165, 176-177..... | 12 | 15 | 24 | 36 |
| 4 | +Objects listed on pages 166-175, 178-181..... | 12 | 15 | 24 | 36 |
| Property Insured Whether or Not in Storage | | | | | |
| 1 | Boilers and Fired Vessels (Limited Coverage) listed on pages 102-109 Objects listed on pages 112-121... (See Note Below) | 6 | 9 | 15 | 24 |
| 2 | Boilers and Fired Vessels (Broad Coverage) listed on pages 102-109, with or without Objects listed on pages 112-121..... | 12 | 18 | 30 | 48 |
| 3 | *Objects listed on pages 130-165, 176-177..... | 18 | 27 | 45 | 72 |
| 4 | +Objects listed on pages 166-175, 178-181..... | 18 | 27 | 45 | 72 |

*If the Objects for which insurance is provided under this classification Include Turbine with Driven Electric Generators insured for Breakdown Coverage of Combined Coverage or Deep-Well Pump Units, two rates are required, one from Class 3 and one from Class 4.

+If the Objects for which insurance is provided under this classification include Small Refrigerating Units, Small Compressing Units or Air Conditioner Units, three rates are required: one from Class 1 or 2, one from Class 3 and one from Class 4.

Note: If insurance applies with respect to Objects in Class 1 and also to Objects in Class 2, no rate is required for Class 1.

(**)The page references listed by Object Class pertain to those of the NBCU Boiler and Machinery manual.

National Bureau of
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Exhibit V

BOILER AND MACHINERY

1961 Revision of Direct Damage Rates

Indicated Object Rate Level Change

| | | |
|---|---|---|
| 1. | 1956-1958 Object Rate Earned Premium on Present Level | $104,603,117 |
| 2. | 1956-1958 Losses up to $25,000 including all Loss Adjustment | 28,171,535 |
| 3. | Indicated Loss and Loss Adjustment Ratio (2) ÷ (1) | .269 |
| 4. | 1956-1958 Inspection Expenses in Object Rates including Trend (Appendix I) | 33,909,557 |
| 5. | Indicated Inspection Ratio (4) ÷ (1) | .324 |
| 6. | Indicated Loss and Inspection Ratio (3) + (5) | .593 |
| 7. | Expected Loss, Loss Adjustment and Inspection Ratio | .505 |
| 8. | Indicated Rate Level Percentage Change [(6) ÷ (7)] - 1.0 | +17.4% |

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Exhibit VI

BOILER AND MACHINERY

1961 REVISION OF DIRECT DAMAGE RATES
DEVELOPMENT OF OBJECT RATE INDICATED PERCENTAGE CHANGES

| (1) | (2) | (3) | 1954-1958 Loss & Loss Adjustment Pure Premium | | 1955-1958 Inspection Pure Premium | | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Object | 1954-1958 Number of Earned Objects | 1954-1958 Premium at Present Average Rates | (4) Actual | (5) On Proposed Level | (6) Actual | (7) On Proposed Level | Present Average Rate | 1954-1958 Loss and Inspection Ratio on Proposed Level [(5)+(7)] ÷ (8) | Credibility | Formula Loss and Inspection Ratio [(9)x(10)] +.593x [1.0-(10)] | Col.(11) as Ratio to Boiler and Machinery Total | Formula Rate Level Change [(12) x 1.174] -1.0 | Indicated Rate Level Change |
| Steel Boilers-Steam-15 lbs. or less incl. Hot Water Heating and Supply Boilers | 103,343 | $ 1,456,598 | $ .46 | $ .47 | $ 9.57 | $10.37 | $14.09 | .769 | .40 | .663 | 1.103 | +29.5% | +25.0% |
| Fire Tube Boilers-Steam-over 15 lbs. | 53,924 | 1,561,307 | 1.93 | 1.97 | 21.27 | 23.05 | 28.95 | .864 | .40 | .701 | 1.166 | +36.9 | +25.0 |
| Oil or Gas Drilling Boilers | 1,242 | 66,236 | 9.17 | 9.38 | 19.24 | 20.85 | 53.33 | .567 | 0 | .593 | .987 | +15.9 | +25.0 |
| Small Compressing Machines | 27,297 | 320,742 | .29 | .30 | 5.45 | 5.91 | 11.75 | .529 | .20 | .580 | .965 | +13.3 | +25.0 |
| Deep Well Pump Units | 14,198 | 683,629 | 27.62 | 28.25 | 8.58 | 9.30 | 48.15 | .780 | .30 | .649 | 1.080 | +26.8 | +25.0 |
| Air Conditioners | 19,619 | 1,006,324 | 7.30 | 7.47 | 5.46 | 5.92 | 51.29 | .261 | .30 | .493 | .820 | -3.7 | +6.3 |
| Miscellaneous Electrical Apparatus | 53,534 | 6,118,059 | 28.38 | 29.03 | 13.86 | 15.02 | 114.28 | .385 | .90 | .406 | .676 | -20.6 | -12.3 |
| Total Electrical Machinery | 908,147 | 32,629,011 | 10.71 | 10.95 | 6.11 | 6.63 | 35.93 | .489 | | .508 | .845 | -0.8 | +9.2 |
| Total-Direct Damage Machinery | 1,534,073 | 60,947,925 | 12.87 | 13.16 | 6.56 | 7.11 | 39.74 | .510 | | .529 | .880 | +3.3 | +11.9 |
| Total-Direct Damage-Boiler and Machinery | 10,482,702 | 171,455,770 | 4.30 | 4.40 | 4.90 | 5.30 | 16.36 | .593 | | .601 | 1.000 | +17.4 | +17.4 |

National Bureau of
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Exhibit VII

BOILER AND MACHINERY

1961 Revision of Direct Damage Rates

Credibility Table

| Premium | Credibility |
|---|---|
| 0 - 69,999 | .0 |
| 70,000 - 279,999 | .10 |
| 280,000 - 629,999 | .20 |
| 630,000 - 1,119,999 | .30 |
| 1,120,000 - 1,749,999 | .40 |
| 1,750,000 - 2,519,999 | .50 |
| 2,520,000 - 3,429,999 | .60 |
| 3,430,000 - 4,479,999 | .70 |
| 4,480,000 - 5,669,999 | .80 |
| 5,670,000 - 6,999,999 | .90 |
| 7,000,000 - and over | 1.00 |

BOILER AND MACHINERY

1961 REVISION OF DIRECT DAMAGE RATES

COMPOSITE PERCENTAGE CHANGES REFLECTING OBJECT RATE EXPERIENCE AND REVISED DEFINITIONS OF ACCIDENT

| | (1) Type of Object | (2) Percent Change from Col. (14) Exhibit IV | (3) Additional Loss Hazard (a) Based on Company Estimates† | (3) Additional Loss Hazard (b) Limited to Reproduce Maximum Change of +33.3% | (4) Proposed Percent Change Including Add'l. Loss Hazard |
|---|---|---|---|---|---|
| Limited Coverage | All Types of Objects Combined | +23.6% | - | - | +23.6% (a) |
| Broad Coverage | Steel Boilers-Steam-15 lbs. or less incl. Hot Water Heating and Supply Boilers . . . . | +25.0 | +5.0% | - | +26.4 |
| | Fire Tube Boilers-Steam-over 15 lbs. . . . . | +25.0 | +5.0 | - | +27.1 |
| | Oil or Gas Drilling Boilers . . . . | +23.8 | +5.0 | - | +27.9 |
| Electrical Machinery | Small Compressing Machines . . . . | +25.0 | +5.0 | - | +26.0 |
| | Deep Well Pump Units . . . . . | +25.0 | +5.0 | - | +29.4 |
| | Air Conditioners . . . . . | +6.3 | +5.0 | - | +8.5 |
| | Miscellaneous Electrical Apparatus | -12.3 | +5.0 | - | -9.5 |
| | Total Electrical Machinery . . . . | +9.2 | +5.0 | - | +12.5 |
| Total-Machinery | Total-Direct Damage - Machinery | +11.9 | +11.4 | +10.4 | +19.3 |
| Total-Boiler and Machinery | | +17.4 | +6.9 | +6.4 | +20.9 |

National Bureau of
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Exhibit IX

BOILER AND MACHINERY

1961 REVISION OF DIRECT DAMAGE RATES

Excess Limits, Location, Portable Object
and Bodily Injury Experience

| (1) Accident Year | (2) Earned Premium on Present Rate Level | (3) Incurred Losses in Excess of $25,000, and Bodily Injury Losses* | (4) Inspection Expenses Not Included in Object Rates | (5) Loss & Inspection Ratio [(3)+(4)] ÷(2) |
|---|---|---|---|---|
| 1956 | $7,540,789 | $ 465,184 | $1,521,974 | .264 |
| 1957 | 7,830,708 | 1,283,501 | 1,518,273 | .358 |
| 1958 | 8,152,932 | 1,464,190 | 1,555,831 | .370 |
| Total | 23,524,429 | 3,212,875 | 4,596,078 | .332 |

*Including all loss adjustment expenses.

1961 REVISION OF USE AND OCCUPANCY INSURANCE RATES

Use and Occupancy Experience for Accident Years 1954-1958

All Forms

| Coverage | Year | Earned Premium on Present Level | Incurred Losses* | Number Of Claims | Loss Ratio |
|---|---|---|---|---|---|
| Boiler | 1954 | $ 5,888,961 | $ 1,023,271 | 506 | 17.4 |
| | 1955 | 5,652,384 | 1,604,027 | 481 | 28.4 |
| | 1956 | 6,499,399 | 2,015,546 | 581 | 31.0 |
| | 1957 | 7,168,986 | 5,779,815 | 504 | 80.6 |
| | 1958 | 7,333,478 | 1,924,670 | 509 | 26.2 |
| | Total | 32,543,208 | 12,347,329 | 2,581 | 37.9 |
| Machinery | 1954 | 10,427,631 | 2,127,083 | 655 | 20.4 |
| | 1955 | 10,508,211 | 3,760,456 | 773 | 35.8 |
| | 1956 | 12,763,195 | 3,527,218 | 757 | 27.6 |
| | 1957 | 13,074,128 | 5,108,474 | 809 | 39.1 |
| | 1958 | 12,101,983 | 2,845,575 | 750 | 23.5 |
| | Total | 58,875,148 | 17,368,806 | 3,744 | 29.5 |
| Total+ | 1954 | 16,431,206 | 3,170,966 | 1,164 | 19.3 |
| | 1955 | 16,192,710 | 5,364,483 | 1,254 | 33.1 |
| | 1956 | 19,263,626 | 5,542,764 | 1,338 | 28.8 |
| | 1957 | 20,244,367 | 10,888,289 | 1,313 | 53.8 |
| | 1958 | 19,435,650 | 4,770,245 | 1,259 | 24.5 |
| | Total | 91,567,559 | 29,736,747 | 6,328 | 32.5 |

*Including all Loss Adjustment Expenses.
+Including Actual Loss Sustained Unsegregated Codes.

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Exhibit XI

BOILER AND MACHINERY

1961 REVISION OF USE AND OCCUPANCY RATES

DEVELOPMENT OF PROPOSED RATE LEVEL CHANGES BY RATING GROUP

| (1) Rating Group | (2) 1953-1957 Earned Premium on Present Rate Level | (3) 1953-1957 Incurred Loss and Loss Adj. | (4) 1953-1957 Number of Claims | (5) 1953-1957 Loss & Loss Adj. Ratio on Present Level | (6) Credibility | (7) Formula Loss & Loss Adj. Ratio on Present Level [(5)x(6)] + .321x[1.0-(6)] | (8) Col. (7) As Ratio to Boiler and Machinery Total | (9) Formula Rate Level Change [(8)x.900] -1.0 | (10) Proposed Rate Level Change |
|---|---|---|---|---|---|---|---|---|---|
| Steel Boilers-Steam-15 lbs. or less incl. Hot Water Heating and Supply Boilers; Cast Iron Boilers; Gas Fired Radiators; Coil or Storage Water Heaters | $ 1,712,995 | $ 275,872 | 214 | .161 | .40 | .257 | .911 | -18.0% | -20.0% |
| All Other Boilers and Fired Vessels | 22,768,770 | 3,833,294 | 1,820 | .168 | 1.00 | .168 | .596 | -46.4 | -20.0 |
| Furnace Explosion | 600,584 | 134,439 | 173 | .224 | .20 | .302 | 1.071 | -3.6 | -18.5 |
| Unfired Vessels | | | | | | | | | |
| Types 1, 2 and 5 | 2,677,429 | 5,859,806 | 204 | 2.189 | .60 | 1.442 | 5.113 | +360.2 | +25.0 |
| Types 3 and 4 | 1,345,840 | 807,333 | 40 | .600 | .40 | .433 | 1.535 | +38.2 | +16.8 |
| Furnace Transformers and Mercury Arc Rectifier Transformers | 712,126 | 755,247 | 36 | 1.061 | .30 | .543 | 1.926 | +73.3 | +25.0 |
| Power & Distribution Transformers and Induction Feeder Regulators | 6,391,145 | 618,763 | 123 | .097 | .90 | .119 | .422 | -62.0 | -20.0 |
| Miscellaneous Electrical Apparatus | 5,240,171 | 1,767,193 | 657 | .337 | .80 | .334 | 1.184 | +6.6 | -9.9 |
| Total | 86,434,125 | 27,776,077 | 6,143 | .321 | | .282 | 1.000 | -9.9 | -10.0 |

## APPENDIX

### CALCULATION OF INSPECTION EXPENSES IN OBJECT RATES

In the reporting of Inspection and Boards and Bureaus expenses to the National Bureau under the Boiler and Machinery statistical plan, the dollars of expenses for these two categories are apportioned over the types of objects for direct damage coverages by giving "due consideration to a record of the number of inspection hours in the necessary details."[1] This procedure allocates all of the inspection expense to an object type; both the inspection expenses that will be measured in the object charge and those that will be measured in the location and portable objects charge.

In the calculation of the proposed inspection expenses contained in the object charge, the inspection expenses of the location and portable objects charges were first ascertained and by deducting these from the total inspection expenses, the remainder was considered to be those present in the object charge. In addition, a trend factor was introduced into the calculation so as to reflect steadily increasing engineering and inspection costs in the industry. Exhibit I of this Appendix illustrates the development of the two segments of inspection expenses.

In the judgment of the underwriters and the engineers, the current average cost of traveling to and from a location and the accompanying expenses of lodging, meals and so forth was proposed to be $28, with $12 being proposed for these expenses in connection with portable objects. The premium and expense data of calendar years 1956 through 1958 were used in the calculation of inspection expenses for the 1961 revision.

The number of written locations, as shown in Column (1), was derived from the number of location charges reported to the National Bureau by all carriers writing Boiler and Machinery insurance in the continental United States under the then existing satistical plan. Under the current plan, where the number of months coverage in each calendar year is reported for each location for the location, portable object, and bodily injury liability charges, the number of written locations for the location and portable object charges are calculated by dividing the total number of location months for the experience period by 36, since these charges are contemplated to be on a three year basis.

The proposed written inspection premium in the location charge is calculated by multiplying the proposed inspection amount in the location charge by the number of written locations, the results of which are shown in Column (3). These written inspection premiums do not take into con-

[1] NBCU Boiler & Machinery Insurance Statistical Plan.

sideration the 40% discount allowed in the location charge on the more than two locations which are situated within the boundaries of a single city or village. From data developed by a large carrier in comparing the collected to the collectible location charges, it was determined that this discount reduces the overall location charges by 5%, hence the use of only 95% of the written inspection premium in the location charge for further calculations as shown in Line (4). The proposed written inspection premium for the portable object charge is calculated in a similar manner and is also shown in Column (3). All of the portable object written inspection premiums are combined with the discounted location charge inspection premiums to obtain the proposed written inspection premiums in the location and portable object charges of Line (5). These written inspection premiums were adjusted to an earned basis on Line (9) by the application of an earned to written ratio based upon the total written and earned premiums developed from the reportings to the NBCU on the location and portable object charges for calendar years 1956 through 1958. The pure inspection dollars were obtained through the application of the proposed loss, loss adjustment and inspection ratio of .505 which eliminates all categories of expenses, except inspection and loss adjustment, from the earned premium which has been determined.

The total incurred inspection expense, Line 11, as reported to the NBCU for the three calendar years, were adjusted to reflect the subsequent trend in inspection costs in 1959 as determined from the data shown in Exhibit II of this Appendix. A comparison of the ratios of actual Inspection and Boards and Bureaus expenses paid to earned premiums on present level was made of 1959 to those of the experience period being used which indicated an increase of 7.7%. Further comparisons were made of pertinent data furnished by the U.S. Department of Labor for the first nine months of 1960 to that of the experience period. Additional non-industry data was utilized comparing hotel prices, as published by two noted research consulting firms, of 1959 to those for the experience period. All sources indicated that an increase in the cost of inspection services was evident. A trend factor of 1.075 was proposed to be incorporated into this rate revision, the resulting incurred inspection expenses reflecting current costs being shown on Line (13). The proposed inspection dollars in the object rate are then the remainder of the subtraction of the pure inspection dollars in the location and portable object charges from the incurred inspection expense of Line (13). The ratio of the inspection pure premium in the location and portable objects charges is developed, as shown on Line (15), to be used in later calculations.

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Appendix
Exhibit I

BOILER AND MACHINERY

1961 REVIEW OF DIRECT DAMAGE RATES

CALCULATION OF INSPECTION EXPENSES IN OBJECT RATES

| | (1) 1956-1958 Number of Written Locations | (2) Proposed Inspection Amount in Location Charge | (3) Proposed Written Inspection Premium in Location Charge (1)x(2) |
|---|---|---|---|
| Locations (a) | 331,168 | $28 | $9,272,704 |
| Portable Objects (b) | 12,249 | 12 | 146,988 |
| (4) Proposed written inspection premiums in location charges discounted for multiple locations (3a) x .95* | | | $8,809,069 |
| (5) Proposed written inspection premium in (4) plus proposed written inspection premium in portable object charges (4)+(3b) | | | 8,956,057 |
| (6) 1956-1958 Earned location and portable object charges | | | 15,624,435 |
| (7) 1956-1958 Written location and portable object charges | | | 15,375,315 |
| (8) Ratio of earned charges to written charges | | | 1.0162 |
| (9) Proposed earned inspection in (5) (5)x(8) | | | 9,101,145 |
| (10) Dollars for pure inspection in (9) (9)x.505 | | | 4,596,078 |
| (11) 1956-1958 Incurred inspection expenses | | | 35,819,195 |
| (12) Factor to reflect subsequent trend in inspection costs (See Exhibit II) | | | 1.075 |
| (13) 1956-1958 Incurred inspection expenses reflecting subsequent trend (11)x(12) | | | 38,505,635 |
| (14) Proposed inspection dollars in object rates (13)-(10) | | | 33,909,557 |
| (15) Percent of inspection pure premium in the location and portable object charges [(10 ÷ (11)] | | | 12.83% |

*Determined from data used in 1948 rate revision

BOILER AND MACHINERY

1961 REVISION OF DIRECT DAMAGE RATES

Inspection Trend Data

A. COMPARISON OF EXPENSE RATIOS FOR CALENDAR YEARS 1956-1959
INSURANCE EXPENSE EXHIBIT - COUNTRYWIDE DATA OF THE MEMBERS
OF THE NATIONAL BUREAU OF CASUALTY UNDERWRITERS

| | 1956 | 1957 | 1958 | 1956-1958 | 1959 | Increase Over 1956-1958 |
|---|---|---|---|---|---|---|
| Inspection Expense Paid (Including Boards, Bureaus and Associations) on Present Rate Level | 25.9 | 26.1 | 26.0 | 26.0 | 28.0 | + 7.7% |

B. ITEMS AFFECTING INSPECTION EXPENSES

| | 1956 | 1957 | 1958 | 1956-1958 | Jan.-Sept. 1960 | Increase Over 1956-1958 |
|---|---|---|---|---|---|---|
| 1. Average Weekly Earnings in Insurance Industry* | $77.49 | $80.73 | $82.97 | $80.40 | $87.73 (Jan.-July) | + 9.1% |
| 2. Retail Prices - All Foods* | 111.7 | 115.4 | 120.3 | 115.8 | 119.2 | + 2.9 |
| 3. Retail Prices - Food away from home ♦ | 105.4 | 109.3 | 112.6 | 109.1 | 118.5 | + 8.6 |
| 4. Prices - Transportation* | 128.7 | 136.0 | 140.5 | 135.1 | 146.2 | + 8.2 |
| 5. Hotel Prices | | | | | | |
| a) Horwath & Horwath, Hotel Accountants and Consultants | 192.0 | 204.0 | 210.0 | 202.0 | 218.0(1959) | + 7.9 |
| b) Harris, Kerr, Forster & Company - Accountants and Consultants | 243.0 | 259.0 | 268.0 | 256.7 | 280.0(1959) | + 9.1 |

*Source: Monthly Labor Review - U.S. Department of Labor.
♦Source: Consumer Price Index - U.S. Department of Labor.

C. PROPOSED TREND FACTOR = 1.075