THE BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN

BY

ROBERT B. FOSTER

The Boiler and Machinery Premium Adjustment Rating Plan of the National Bureau of Casualty Underwriters is a retrospective type plan that is available on an optional basis in all States for the large Boiler and Machinery risks on either an intrastate or interstate basis. The Plan was introduced in 1947 and at the present time it provides about 15% of the Boiler and Machinery premium volume. As with other retrospective rating plans, the premium for a risk is determined, within maximum and minimum limits, by the losses incurred during the policy period. To be eligible a risk must have a three-year Standard Premium of at least $25,000 for all States except New Jersey and Texas, where the eligibility requirements are less stringent.* Currently one out of every four or five risks that are eligible are written under the Plan. The Standard Premium for a risk is the premium prior to the application of any premium gradation. The policies of two or more carriers covering the same exposures may be combined for rating under the Plan, if this is acceptable to the carriers involved. The Plan must be elected prior to the policy period that is to be covered.

The formula used to determine the premium after the expiration of the policy is:

$$R = (B + C \times L)\ (1/1 - T),\ H \leqq R \leqq G,$$

using standard notation.** Here R is the Retrospective Premium for the risk as determined by the formula. The Fixed Charge (Basic Premium), B, is that part of the Standard Premium, to be designated by P, which provides for all expenses, other than taxes, that are not related to losses. The Loss Adjustment and Inspection expenses, which are related to losses, are provided for by C, which is called the Loss Conversion Factor. C is applied to the losses, L, which are incurred in the policy period and which are limited to a certain amount for any one accident. Since taxes vary with the final premium charged, i.e. the Retrospective Premium, R, they are provided for by means of a Tax Multiplier, 1/(1–T). H is the Minimum Premium limitation on R and G is the Maximum limitation. G and H are determined from Selected Maximum and Minimum loss ratios.

In Boiler and Machinery insurance there are two types of coverage,

* In New Jersey a three-year Standard Premium of at least $25,000 is required except that a risk with loss experience that is worse than average may qualify with a three-year Standard Premium of $5,000. In Texas all risks with a three-year Standard Premium of at least $5,000 are eligible for the Plan.

** "An Actuarial Analysis of Retrospective Rating" by Thomas O. Carlson in the *Proceedings*, Vol. XXVIII, p. 283.

Direct Damage coverage, providing insurance for property damaged by an accident to an insured object, and Indirect Damage insurance, of various kinds, which can be provided by endorsement to the Boiler and Machinery policy. The kinds of Indirect Damage coverage and their definitions are as follows:

Use and Occupancy—This is the most important form of Indirect insurance. It reimburses the assured for loss of earnings resulting from his inability to use or occupy the premises because of a Boiler or Machinery accident.

Outage—This form of Indirect insurance provides indemnity for each hour an object is disabled by an accident to the object.

Consequential Damage—This form provides indemnity against loss by spoilage of property from lack of power, light, heat, steam or refrigeration.

Power Interruption—This coverage applies when there is an Indirect type of loss because of an accident to the physical equipment of a Public Utility supplying service to the assured.

Because of the different nature of these coverages a separate limitation of losses to be included in the rating formula is made for Direct Damage and for each type of Indirect Damage coverage. For Use and Occupancy, Outage and Power Interruption, there is, in addition, a Maximum limitation on the amount of Daily Indemnity to be included. The combined limits for all coverages for any one accident cannot be greater than 80% of the Selected Maximum loss ratio times the Standard Premium, P, except that the Direct Damage limit must be at least $5,000 (the basic limit), and each type of Indirect Coverage may have a limit of $5,000 regardless of the 80% limitation. The primary reason for the accident limitation of the Plan is to separate those losses of a magnitude which could be considered normal from those which are abnormally high. The purpose of the 80% limitation is to prevent any one loss from producing the Maximum Premium.

Because of the restrictions on L, the Standard Premium, P, is computed in two parts, one for the accident limits within the Plan, which will be designated by Pl, and the other for the portion of P in excess of the accident limits, which will be designated by Pe. To illustrate, let us assume the following:

1. A Direct Damage limit per accident of $500,000 for the policy,
2. Use & Occupancy Rating Daily Indemnity of $2,000 and a limit of loss of $200,000 for the policy,
3. Accident limits within the Plan of $5,000 for Direct Damage losses and 5 days at $2,000 per day, or $10,000, for Use & Occupancy.

For this particular risk, we would then have:

a)	Standard Premium Within Accident Limitations, Pl	
	1. Location Charge for $5,000 Accident Limit . .	$ 16
	2. Boiler Object Charges	5,400
	3. Machinery Object Charges	14,000
	4. Use & Occupancy $2,000 per day for 5 days . .	22,050
		$41,466
b)	Standard Premium in Excess of Accident Limitation, Pe	
	1. Location Charge over $5,000 Accident Limit .	$ 269
	2. Boiler Excess Limits Charge 5,400 × .08 . .	432
	3. Machinery Excess Limits Charge 14,000 x .08	1,120
	4. Use & Occupancy $2,000 per day for 95 days over 5 days	19,320
		$21,141
c)	Total Standard Premium, P	$62,607

Having determined the Pl, it is necessary to calculate the Expected Losses, i.e. the expected value of L. Since the Inspection cost varies with each type of object and the Inspection and loss elements combined are a fixed percentage, 49%, of the Standard Premium, the loss element also varies. To facilitate the determination of Expected Losses, Table C, showing the Expected Loss Factors, is shown in Appendix III.

The determination of the rating values is best illustrated by following a sample calculation. The form used is shown on the next page.

Items 1 and 2 are the Standard Premiums, P and Pl, previously calculated.

Item 3 is the sum of the Expected Losses for the various Expected Loss groups underlying Pl. In this case, the Expected Loss Factor for the Location Charge is .12 and produces Expected Losses of $2. The Boiler and Machinery objects have various Expected Loss Factors with Expected Losses of $4,744 and the Use and Occupancy Expected Loss Factor is .44 producing Expected Losses of $9,702. Their sum equals $14,448.

Item 4 is the provision in P for Administration and Production Expenses, and Profit and Contingencies. The premium is graded on these items with the standard expense provision of 45% for the first $3,000 of Standard Premium and 21% for the Standard Premium in excess of $3,000. The makeup of the expense ratios is as follows:

Expense Item	*Percent of Standard Premium*	
	First $3,000	*Over $3,000*
Administration	12.5%	5.625%
Production	30.0	13.500
Profit and Contingencies	2.5	1.875
	45.0%	21.000%

$(45\% \times 3{,}000 + 21\% \times 59{,}607 = 13{,}867)$

The expense provisions may be adjusted to meet any exceptional requirements of individual risks in most states.* This item is part of B, the Fixed Charge, and because it was determined on the total Standard Premium, P, it provides for the Administration, Production and Profit & Contingencies for Pe as well as for Pl.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN
FORM I — CALCULATION OF RATING VALUES

Rating Data

1.	Total Initial Standard Premium	$62,607
2.	Portion of (1) Within Accident Limitations	$41,466
3.	Expected Losses in (2) (based on Table C factors)	$14,448
4.	Provision in (1) for Admin. and Production Expenses, Profit and Contingencies	$13,867
5.	Portion of Inspection and Claim Expense Provision in (2) to be charged in Proportion to Losses (not over 50%)	33%
6.	Selected Maximum Loss Ratio	.350
7.	Selected Minimum Loss Ratio	.050

Determination of Loss Conversion Factor

8.	Provision in (2) for Inspection and Claim Expenses [(2) × .51] – (3)	$ 6,700
9.	Portion of (8) in Loss Conversion Factor (8) × (5)	$ 2,211
10.	Loss Conversion Factor [(9) ÷ (3)] + 1.0	1.153

Determination of Insurance Charge

11.	Expected Loss Factor (3) ÷ (1)	.231
12.	Ratio of Maximum Rated Losses to Expected Losses (6) ÷ (11)	1.515
13.	Excess Charge from Table A entered with (3) and (12)	.091
14.	Ratio of Minimum Rated Losses to Expected Losses (7) ÷ (11)	.216
15.	Loss Saving from Table B entered with (3) and (14), not to exceed (13)	.001
16.	Insurance Charge [(13)–(15)] × (11) × (10)	.024

* All States except Florida, Kansas, Louisiana, New York, North Carolina, South Carolina, Tennessee, Texas, and Virginia.

Determination of Fixed Charge, Maximum and Minimum Premium Ratios (Expressed as Ratios to Total Standard Premium)

17.	Provision for Losses and Inspection and Claim Expenses in Premium in Excess of Accident Limitations [(1) – (2)] × .51	$10,782
18.	[(4)+(8)–(9)+(17)]÷(1)	.465
19.	Fixed Charge (16) + (18)	.489
20.	Maximum Premium Prior to Tax Multiplier [(6)×(10)]+(19)	.893
21.	Minimum Premium Prior to Tax Multiplier [(7)×(10)]+(19)	.547
22.	Maximum Premium (20) × 1.042	.931
23.	Minimum Premium (21) × 1.042	.570

Item 5 is the portion of the combined Inspection and Claim expense provision in Pl that is to be related to the losses, L. This ratio is limited to 50% since part of the Inspection and Claim expense elements are assumed not to vary with losses.

Items 6 and 7 are selected as values that will give the desired Maximum and Minimum Premiums.

Items 8, 9, and 10 are used to determine C, the Loss Conversion Factor.

Item 8 determines the Inspection and Claim expenses available in Pl. Since in Boiler and Machinery insurance the fixed ratio of .51, related to ungraded Manual premium, is for losses, Inspection, and Claim expenses combined, the provision for the Inspection and Claim expense portion is determined by deducting the Expected Losses determined in Item 3 from .51 of Pl.

Item 9 gives the amount of Inspection and Claim expenses which would be provided by C if the losses, L, should equal the Expected Losses.

Item 10 is the Loss Conversion Factor to be applied to the losses, L.

Items 11 through 16 are used to determine the Insurance Charge, which is required because the Retrospective Premium, R, cannot be greater than the Maximum Premium, G, nor less than the Minimum Premium, H. The limitation H provides a saving which is used to partly or wholly offset the charge required because of the limitation G.

Item 11 relates the Expected Losses for Pl to the total Standard Premium, P.

Item 12 relates the Selected Maximum loss ratio to the Expected Loss Factor of Item 11.

Item 13 gives the charge for limiting the losses to the ratio of Item 12. Because the amount of the charge required is related to the size of the Expected Losses—the larger the Expected Losses the less likely a variation in loss ratio great enough to exceed the ratio of Item 12—a table of ratios of Maximum Rated Losses to Expected Losses for various Expected Loss sizes is used. This table, Table A, is shown in Appendix I. It is to be noted that for Expected Losses in excess of $25,000, the $25,000 value is to be used. The reason for this is that for the multiplicity of exposures for Boiler and Machinery risks, there is a certain residual variation in Expected Losses above this area of value regardless of Expected Loss size.

Item 14 relates the Selected Minimum loss ratio to the Expected Loss Factor of Item 11.

Item 15 makes use of another table, Table B, to determine the premium saving because of the Minimum. Table B is shown in Appendix II. In no event is the saving to exceed the charge of Item 13. This is a practical underwriting consideration since the loss of premium because of a negative Insurance Charge would only be recovered if the risk earned less than the Minimum.

Item 16, the Insurance Charge, is the net of Items 13 and 15, increased for the corresponding Loss Adjustment expenses and related to the total Standard Premium, P. This item cannot be negative because of the restriction on Item 15.

Item 17 is for losses and Inspection and Claim expenses in Pe.

Item 18 is the expense ratio, related to P, of all items except taxes and the expenses included by the Loss Conversion Factor, and includes an amount to cover the losses, Inspection and Claim expenses of Item 17.

Item 19 is the Fixed Charge which, in addition to the expenses of

Item 18, includes the Insurance Charge computed in Item 16.

Item 20 is the sum of the Fixed Charge ratio and the Selected Maximum loss ratio multipled by C in order to include the related Claim and Inspection expenses.

Item 21 is the sum of the Fixed Charge Ratio and the Selected Minimum loss ratio multiplied by C.

Item 22 is the Maximum Premium ratio, including taxes. The premium tax rate is 4%; hence the Tax Multiplier is $1/(1-.04) = 1.042$.

Item 23 represents the Minimum premium, including taxes, payable in the event the losses are equal to or less than the Selected Minimum loss ratio times P.

If Direct Damage Deductible Insurance is afforded, the National Bureau determines the Expected Losses and the provision for Inspection and Claim expenses to be used. The calculation of rating values follows the same procedure as for full coverage, except that the expenses are handled in such a way as to produce the same expense allowance as under full coverage. In the States permitting adjustment of the expense items, the Administration expense is generally related to the deductible Standard Premium instead of the full coverage Standard Premium. The Production, Profit and Contingencies, and tax elements are always related to the deductible Standard Premium.

A special endorsement is prepared for policies to which the Boiler and Machinery Premium Adjustment Rating Plan is applied. The standard endorsement form is shown on the next page. Note that the Deposit Premium for the risk is the Standard Premium adjusted for premium gradation. Thus the same Advance Premium applies as though the policy were written under the Guaranteed Cost Plan. Because the assured has some control over the determination of the amount of loss, a clause is included providing for notification to the insurer within 60 days following the date of an accident. This is important in order for the risk experience and accident prevention procedures to be properly appraised. In addition, the endorsement gives the date of the first adjustment of premium to be charged the risk, and the provisions for subsequent adjustments. Once the rating values are established, they are not subject to modification during the policy term. Special provision is made in the endorsement to cover the possibility of cancellation by the assured or the company.

Tables A and B are more familiarly known as Table M, which is the table used to determine the Insurance Charge for retrospectively rated Workmen's Compensation and Liability risks. Analyses of average claim costs and underwriting judgment indicated that the ratio of losses in excess of a given ratio was equally applicable to Boiler and Machinery Insurance as to the Workmen's Compensation line. Hence, the Table was adopted without change except for the $25,000 end point. The use of Table M was extended to the Liability lines in Plan D in 1949. The end point of Table M is higher because Experience Rating of large Workmen's Compensation and Liability risks reduces the divergence between actual and expected loss costs.

At the time of the first adjustment, which is within six months after the expiration of the policy period, the losses are analyzed, and those losses within the accident limitations are put into the rating formula. The Standard Premium is revised, if there were exposure changes, and the rating values are applied to the adjusted Standard Premium. A calculation of the Retrospective Premium is shown below.

Assuming no change in the Standard Premium and total losses of $10,000 with no losses in excess of the accident limitations for the Plan, we would have the following calculation of Final (Retrospective) Premium.

(Boiler and Machinery)

ENDORSEMENT
PREMIUM ADJUSTMENT RATING PLAN

ENDORSEMENT NO.....

This Endorsement forms a part of Policy No. ..... and is effective from noon of .....

Assured .....

DEPOSIT PREMIUM

A. The Assured shall pay to the Company as a Deposit Premium, as of the effective date of the policy, the initial Standard Premium modified by the application of Premium Gradation, which Deposit Premium shall be modified throughout the term of the policy for changes in insurance

EARNED PREMIUM

B. The Earned Premium as developed by this Endorsement is the [amount obtained by the application of the Tax Multiplier to the] [1] sum of:

(1) The Fixed Charge, and

(2) .....% of the Incurred Losses.

The Earned Premium so developed is the premium for the policy, but shall not be less than the Minimum Premium nor more than the Maximum Premium, each as defined herein:

Minimum Premium. The Minimum Premium is .....% of the Standard Premium.

Maximum Premium. The Maximum Premium is .....% of the Standard Premium.

ELEMENTS IN DEVELOPMENT OF THE EARNED PREMIUM

C. The computation of the Earned Premium shall be based upon the following elements:

(1) **Standard Premium.** The Standard Premium is the premium developed for the insurance afforded during the term of the policy in accordance with the provisions of the policy, other than this Endorsement and exclusive of application of Premium Gradation.

(2) **Fixed Charge.** The Fixed Charge is .....% of the Standard Premium.

[(3) **Tax Multiplier.** The Tax Multiplier is the factor .....] [1]

(4) **Incurred Losses.** The Assured shall notify the Company of intention to file claim for loss, as specified herein, and shall make tentative estimate of the amount of such loss, within sixty days following the date of the Accident; but this requirement does not modify any policy provision for Notice of Accident to the Company. Incurred Losses shall mean the actual paid losses and the reserves as estimated by the Company for unpaid losses and any allocated loss expense under the policy, as of the computation dates hereinafter specified, provided that:

(a) the limit of such reserves and paid losses to be included herein shall be $..... for any One Accident arising out of the insurance afforded under Coverages [A, B, C, D, E and F] [2] of the Insuring Agreement of the policy [, and

(b) the limit of such reserves and paid losses to be included herein shall be $..... for each Day of Total or Partial Prevention of Business and $..... for all Prevention of Business because of any One Accident arising out of the insurance provided under any Use and Occupancy Endorsement made a part of the policy.] [3]

COMPUTATION OF EARNED PREMIUM

D. The Company shall make an initial computation of the Earned Premium as soon as practicable after the termination or expiration of the policy or not

(Boiler and Machinery)

ENDORSEMENT
PREMIUM ADJUSTMENT RATING PLAN
(Continued)

later than six months thereafter. In this computation the Incurred Losses shall be valued as of the date selected for such initial computation. The Earned Premium determined by the initial computation shall be the final premium for the policy unless further adjustment is requested either by the Company or by the Assured upon notifying the other party within sixty days of the promulgation of the results of such initial computation. Any further adjustments shall be governed by a like procedure. All adjustments hereunder are subject to the Minimum Premium and to the Maximum Premium, as herein defined.

PAYMENT OF EARNED PREMIUM

E. After the Company has made the initial computation of the Earned Premium as provided for in this Endorsement, the Assured shall immediately pay to the Company the difference between such Earned Premium and the premium previously paid to the Company, if the Earned Premium so determined is greater than the premium previously paid. The Company shall return to the Assured the difference between such Earned Premium and the premium previously paid to the Company, if such Earned Premium is less than the premium previously paid. Corresponding adjustments shall be made at the time of any subsequent computation of the Earned Premium.

CANCELATION OF ALL OR PART OF THE POLICY

F. The cancelation or termination of all or part of the policy of which this Endorsement forms a part shall not be deemed to affect such computations of Earned Premium as are provided for in this Endorsement and, to the extent that the terms of this paragraph are contrary to the terms of the Cancelation Condition of the policy, such Condition is hereby modified:

(1) **Cancelation by the Assured or Cancelation by the Company in the event of Non-Payment of Premium.** In the event of such cancelation the Earned Premium shall be determined in accordance with the provisions of this Endorsement except that:
   (a) The Minimum Premium, or the portion of it applicable to such canceled insurance, shall not be less than the amount obtained by the application of Premium Gradation to the Standard Premium developed for such canceled insurance.
   (b) The Maximum Premium shall be based upon the Standard Premium which would have been developed for the policy if such insurance had not been canceled.

(2) **Cancelation by the Company.** In the event of cancelation of the policy by the Company for reasons other than non-payment of premium, the Earned Premium shall be determined in accordance with the provisions of this Endorsement and the term of the policy as referred to in Paragraph C, Section (1) shall be the period that the policy has been in force.

[Countersigned by ..... BLANK INDEMNITY COMPANY ..... Authorized Representative][4]

REFERENCE NOTES

1—If a Company includes the Tax Multiplier in the Fixed Charge and in the Loss Conversion Percentage the matter in brackets is to be omitted.
2—The matter in brackets is dependent upon the coverages included within the General Boiler and Machinery Policy.
3—The matter in brackets is to be included when Use and Occupancy Insurance is involved and if other Indirect Damage coverages are involved the matter in brackets should be correspondingly amended to denote the type of coverage involved to which the loss limitation applies.
4—The matter in brackets and the position thereof and capacity of the person is at the option of the Company in accord with the Company's usual practices.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN

FORM II — CALCULATION OF FINAL PREMIUM

1.	Total Standard Premium	$62,607
2.	Actual Losses Within Accident Limitations, Including Allocated Claim Expense	$10,000
3.	Loss Conversion Factor (Form I, Item 10)	1.153
4.	Fixed Charge (Form I, Item 19)	.489
5.	Maximum Premium Ratio (Form I, Item 22)	.931
6.	Minimum Premium Ratio (Form I, Item 23)	.570
7.	Converted Losses (2) $\times$ (3)	$11,530
8.	Fixed Charge (1) $\times$ (4)	$30,615
9.	$[(7) + (8)] \times 1.042$	$43,915
10.	Maximum Premium (1) $\times$ (5)	$58,287
11.	Minimum Premium (1) $\times$ (6)	$35,686
12.	Final Premium is (9) subject to Maximum in (10) and Minimum in (11)	$43.915

Using symbols, we have:

$$R = (30{,}615 + 1.153 \times 10{,}000)\ (1.042) = 43{,}915$$
$$35{,}686 \leqq R \leqq 58{,}287$$

A "Preliminary Application for Determining Rating Values" must be submitted to the National Bureau of Casualty Underwriters at least ten days prior to the effective date of the Plan. A copy of this form is shown on the next page. Within 30 days after the beginning of the rating period a Supplementary Application must be submitted. This is a duplicate of Form 1 — Calculation of Rating Values except for additional information giving the name and address of the insured, forms of insurance to be included, effective and expiry dates, and accident limitations within the Plan for Direct Damage and for Indirect Damage.

The essential differences between this Plan and Plan D are:

1. One set of rating values as compared with three (or more), which is possible because the Standard Premium can be accurately determined in advance.
2. The total premium for the risk is made a part of the rating

formula, whereas in Plan D the premium in excess of the accident limits for the Plan is handled separately.

3. Although the Loss Conversion Factor for Plan D can be varied, this is not done to as great an extent on individual risks as in the Boiler and Machinery Plan where the Inspection portion of a Boiler and Machinery risk is an important one.

4. The limitation, on the loss limits that may be included in the Plan, to 80% of the Selected Maximum losses (the Selected Maximum loss ratio times the total Standard Premium).

5. In general, much higher eligibility requirements.

The Premium Adjustment Rating Plan offers the better than average risk an opportunity to reduce the cost of his insurance, particularly since there is no experience rating plan for Boiler and Machinery insurance and also makes insurance more readily obtainable for other risks by providing a premium for each risk that is more in keeping with the actual costs. Its use is limited, however, even for many risks that are eligible. This is because of the nature of Boiler and Machinery insurance which is essentially a low frequency, high average claim cost line. For the Boiler Direct Damage coverage the inspection element in the premium is of major importance and the loss element is relatively small. However, risks with considerable Machinery and Indirect Damage exposure do have a reasonably large loss element with higher loss frequency. The loss frequency for all Boiler objects covered for accident years 1948-1952 was 3.6 claims per 1,000 object years. The comparable figure for Machinery objects was 16.1 claims per 1,000 object years.* A multiple location risk is more suited to the Premium Adjustment Rating Plan because of the reduced catastrophe exposure for risks of the same premium size. Because of the Maximum premium feature the Plan is considered to have an advantage over Guaranteed Cost deductible insurance since there is no limit to the number of deductible amounts which the insured must pay in addition to the fixed premium. It can reasonably be concluded that the Premium Adjustment Rating Plan is an important consideration in the underwriting of large Boiler and Machinery risks.

Perhaps inspired by the tabular retrospective rating plans which have been used successfully for Workmen's Compensation risks for some time, a simplified version of the Premium Adjustment Rating Plan, in the form of a tabular plan, is currently being considered for adoption for risks with a Standard Premium of $3,000 or more. If adopted it would make retrospective rating available to a great many risks not eligible at present and would be a useful supplement to the Premium Adjustment Rating Plan.

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*1953 Compilation of Boiler and Machinery Experience — National Bureau of Casualty Underwriters.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN

Preliminary Application for Determining Rating Values

Send two copies to:
National Bureau of Casualty Underwriters
60 JOHN STREET
New York 38, N. Y.

Date.....

1. Name of insured.....
.....

2. Address of insured's headquarters.....
.....

3. Location of all plants or exposures to be rated, including name under which operated .....
.....

4. Forms of Boiler and Machinery insurance to be included in the Plan
.....

5. The percentage of undiscounted standard premium for:

	First $3000	Over $3000
Administration expense	.....%	.....%
Production Cost	.....%	.....%
Profit and Contingencies	.....%	.....%
Total	.....%	.....%

6. Names of all carriers during past year of exposures to be rated and expiration dates of policies .....

7. Effective date of Plan.....Expiration date of Plan.....

Submitted by.....Co.

Address.....

Signed.....

Approved by National Bureau of Casualty Underwriters
per .....
Date .....

S. B. 121A

Appendix I

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN Sheet 1

TABLE A

Table of Charges for Losses in Excess of Ratio R

(Charges Expressed as Ratios to Expected Losses)

Ratio R	Risk Expected Losses							
	$500	$1,000	$1,500	$2,000	$3,000	$4,000	$5,000	$6,000
.80	.611	.552	.516	.493	.455	.432	.413	.397
.81	.608	.547	.512	.489	.449	.427	.408	.392
.82	.605	.543	.508	.484	.444	.422	.403	.387
.83	.602	.540	.504	.480	.440	.418	.399	.383
.84	.599	.536	.500	.476	.436	.413	.394	.378
.85	.596	.533	.496	.472	.432	.409	.390	.374
.86	.593	.529	.493	.468	.428	.405	.386	.370
.87	.590	.526	.489	.464	.424	.401	.382	.366
.88	.588	.522	.485	.459	.420	.397	.377	.361
.89	.585	.519	.481	.455	.416	.393	.373	.357
.90	.583	.516	.477	.451	.412	.389	.369	.353
.91	.580	.512	.473	.447	.408	.385	.365	.349
.92	.578	.509	.469	.443	.405	.381	.361	.345
.93	.575	.505	.465	.439	.401	.377	.357	.340
.94	.573	.502	.462	.436	.398	.373	.353	.336
.95	.570	.499	.458	.432	.395	.370	.349	.333
.96	.568	.496	.455	.429	.391	.366	.346	.329
.97	.565	.493	.452	.425	.388	.362	.342	.325
.98	.563	.490	.449	.422	.385	.359	.338	.321
.99	.560	.487	.446	.419	.382	.356	.334	.318
1.00	.558	.484	.443	.416	.379	.352	.331	.314
1.01	.556	.482	.440	.413	.376	.349	.327	.310
1.02	.553	.480	.438	.410	.373	.345	.323	.307
1.03	.551	.477	.435	.407	.370	.342	.320	.303
1.04	.549	.475	.432	.404	.367	.339	.317	.300
1.05	.548	.473	.430	.401	.364	.336	.313	.296
1.06	.546	.470	.427	.398	.361	.333	.310	.293
1.07	.544	.468	.425	.395	.359	.330	.307	.289
1.08	.542	.465	.422	.393	.356	.327	.304	.285
1.09	.540	.463	.420	.390	.353	.324	.300	.282
1.10	.538	.462	.418	.388	.350	.321	.297	.279
1.11	.537	.460	.416	.386	.347	.318	.294	.275
1.12	.535	.458	.414	.383	.344	.315	.291	.272
1.13	.533	.457	.412	.381	.341	.312	.288	.269
1.14	.532	.455	.410	.378	.339	.309	.285	.266
1.15	.530	.454	.408	.376	.337	.307	.282	.263
1.16	.528	.452	.406	.374	.334	.304	.279	.260
1.17	.527	.450	.404	.372	.332	.302	.277	.257
1.18	.526	.449	.402	.370	.329	.299	.274	.254
1.19	.525	.447	.401	.368	.327	.297	.271	.251
1.20	.524	.446	.399	.366	.325	.294	.269	.248
1.21	.522	.444	.397	.365	.322	.291	.266	.245
1.22	.521	.442	.395	.363	.320	.289	.263	.242
1.23	.520	.441	.393	.361	.317	.286	.260	.239
1.24	.519	.439	.392	.359	.315	.284	.258	.237
1.25	.518	.438	.390	.357	.313	.281	.255	.234

R - Ratio of Maximum Rated Losses to Expected Losses

Note: See sheet 6 for notes on interpolation.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN I Sheet 2

TABLE A

Table of Charges for Losses in Excess of Ratio R

(Charges Expressed as Ratios to Expected Losses)

R - Ratio of Maximum Rated Losses to Expected Losses

Ratio	Risk Expected Losses							
	$500	$1,000	$1,500	$2,000	$3,000	$4,000	$5,000	$6,000
1.26	.516	.438	.388	.356	.310	.279	.253	.231
1.27	.515	.434	.386	.354	.308	.276	.250	.229
1.28	.514	.433	.385	.352	.306	.274	.248	.227
1.29	.513	.432	.383	.350	.303	.272	.245	.224
1.30	.512	.431	.382	.348	.301	.269	.243	.222
1.31	.510	.430	.380	.347	.299	.267	.241	.219
1.32	.509	.428	.379	.345	.297	.265	.238	.217
1.33	.508	.427	.377	.343	.295	.262	.236	.215
1.34	.507	.426	.376	.341	.293	.260	.234	.212
1.35	.506	.425	.374	.340	.291	.258	.231	.210
1.36	.505	.424	.373	.338	.289	.256	.229	.208
1.37	.503	.423	.371	.336	.287	.254	.227	.206
1.38	.503	.422	.370	.334	.285	.252	.225	.204
1.39	.502	.421	.368	.332	.283	.250	.223	.201
1.40	.502	.420	.367	.331	.281	.247	.220	.199
1.41	.501	.419	.365	.329	.279	.245	.218	.197
1.42	.500	.418	.364	.327	.277	.243	.216	.195
1.43	.500	.417	.363	.325	.275	.242	.214	.193
1.44	.499	.416	.361	.324	.273	.240	.213	.191
1.45	.499	.415	.360	.323	.272	.238	.211	.190
1.46	.498	.414	.359	.321	.270	.236	.209	.188
1.47	.497	.413	.358	.320	.268	.234	.207	.186
1.48	.497	.412	.357	.318	.266	.232	.205	.184
1.49	.496	.411	.355	.317	.264	.230	.203	.182
1.50	.496	.410	.354	.316	.263	.228	.201	.180
1.52	.494	.408	.352	.313	.259	.225	.198	.176
1.54	.493	.406	.349	.310	.256	.222	.195	.173
1.56	.492	.404	.347	.307	.253	.219	.191	.170
1.58	.491	.402	.345	.304	.250	.216	.188	.166
1.60	.490	.400	.342	.302	.247	.213	.185	.163
1.62	.488	.398	.340	.299	.244	.210	.181	.160
1.64	.487	.396	.337	.297	.241	.207	.178	.157
1.66	.486	.394	.335	.295	.238	.203	.175	.154
1.68	.485	.392	.333	.292	.235	.200	.173	.151
1.70	.484	.390	.330	.290	.232	.198	.170	.148
1.72	.482	.388	.328	.287	.230	.195	.167	.146
1.74	.481	.386	.325	.285	.227	.192	.165	.143
1.76	.480	.384	.323	.283	.224	.189	.162	.140
1.78	.479	.382	.321	.280	.222	.187	.159	.138
1.80	.478	.380	.318	.278	.219	.185	.157	.135
1.82	.477	.378	.316	.276	.217	.182	.154	.133
1.84	.475	.376	.315	.273	.215	.180	.152	.131
1.86	.474	.374	.311	.271	.212	.177	.150	.128
1.88	.473	.373	.309	.268	.210	.175	.147	.126
1.90	.472	.371	.307	.266	.207	.172	.144	.123

Note: See sheet 6 for notes on interpolation.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN I Sheet 5

TABLE A

Table of Charges for Losses in Excess of Ratio R

(Charges Expressed as Ratios to Expected Losses)

R - Ratio of Maximum Rated Losses to Expected Losses	Risk Expected Losses							
	$500	$1,000	$1,500	$2,000	$3,000	$4,000	$5,000	$6,000
1.92	.471	.369	.305	.264	.204	.169	.142	.121
1.94	.470	.368	.303	.261	.202	.167	.140	.119
1.96	.469	.367	.301	.259	.200	.165	.138	.117
1.98	.468	.365	.299	.257	.198	.163	.136	.115
2.00	.466	.364	.297	.254	.195	.161	.133	.113
2.02	.467	.362	.295	.252	.193	.158	.131	.110
2.04	.466	.361	.293	.250	.191	.156	.128	.108
2.06	.465	.359	.291	.247	.188	.154	.126	.106
2.08	.464	.358	.289	.245	.186	.151	.124	.104
2.10	.464	.357	.287	.242	.183	.149	.122	.102
2.12	.463	.355	.285	.240	.181	.147	.120	.099
2.14	.462	.354	.283	.238	.179	.145	.117	.097
2.16	.462	.353	.281	.236	.176	.142	.115	.095
2.18	.461	.351	.279	.233	.174	.140	.113	.093
2.20	.461	.350	.277	.231	.172	.138	.111	.092
2.22	.460	.348	.275	.230	.170	.136	.109	.090
2.24	.459	.347	.274	.228	.168	.134	.107	.088
2.26	.459	.346	.272	.226	.165	.131	.105	.087
2.28	.458	.345	.270	.224	.163	.129	.103	.085
2.30	.458	.344	.269	.222	.161	.127	.101	.083
2.32	.457	.342	.267	.220	.159	.126	.100	.082
2.34	.456	.341	.265	.218	.157	.124	.098	.080
2.36	.456	.340	.264	.217	.155	.122	.097	.079
2.38	.455	.339	.262	.215	.153	.120	.095	.077
2.40	.455	.338	.260	.213	.151	.118	.093	.076
2.42	.454	.336	.258	.211	.149	.116	.091	.074
2.44	.453	.335	.257	.209	.148	.115	.090	.073
2.46	.453	.334	.255	.208	.146	.113	.089	.071
2.48	.453	.333	.255	.206	.144	.112	.087	.069
2.50	.452	.332	.252	.204	.142	.110	.086	.068
2.55	.451	.329	.247	.199	.137	.106	.082	.065
2.60	.450	.326	.243	.195	.133	.102	.078	.062
2.65	.449	.323	.239	.191	.129	.098	.075	.059
2.70	.448	.320	.235	.187	.125	.094	.071	.056
2.75	.447	.317	.231	.183	.121	.090	.068	.054
2.80	.447	.315	.228	.179	.117	.086	.065	.052
2.85	.446	.312	.224	.175	.114	.083	.062	.050
2.90	.445	.309	.220	.171	.110	.080	.059	.048
2.95	.445	.306	.216	.167	.107	.077	.057	.046
3.00	.444	.303	.212	.163	.103	.075	.055	.044

Note: See sheet 6 for notes on interpolation.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN I Sheet 4

TABLE A

Table of Charges for Losses in Excess of Ratio R

(Charges Expressed as Ratios to Expected Losses)

Ratio R	Risk Expected Losses							
	$7,000	$8,000	$9,000	$10,000	$12,500	$15,000	$20,000	$25,000
.80	.386	.375	.363	.356	.339	.324	.311	.298
.81	.381	.370	.358	.351	.333	.319	.306	.293
.82	.376	.365	.353	.346	.328	.314	.300	.287
.83	.371	.360	.349	.341	.324	.309	.295	.281
.84	.367	.355	.344	.337	.319	.304	.290	.276
.85	.362	.351	.339	.332	.314	.299	.285	.271
.86	.356	.346	.334	.327	.309	.295	.280	.265
.87	.354	.342	.330	.322	.305	.290	.275	.260
.88	.349	.337	.325	.318	.300	.285	.270	.254
.89	.345	.333	.321	.314	.296	.280	.265	.249
.90	.341	.329	.317	.310	.292	.276	.260	.244
.91	.337	.325	.313	.306	.288	.272	.256	.239
.92	.333	.321	.309	.301	.284	.268	.251	.234
.93	.328	.316	.304	.297	.279	.263	.247	.230
.94	.324	.312	.300	.293	.275	.259	.242	.225
.95	.320	.308	.296	.289	.271	.255	.238	.220
.96	.316	.304	.292	.285	.267	.251	.233	.216
.97	.312	.300	.288	.281	.263	.247	.229	.211
.98	.309	.296	.284	.277	.259	.243	.225	.207
.99	.305	.293	.281	.273	.255	.239	.220	.202
1.00	.302	.289	.277	.269	.251	.235	.216	.198
1.01	.298	.286	.273	.266	.247	.231	.212	.194
1.02	.294	.282	.270	.262	.243	.227	.208	.190
1.03	.291	.278	.266	.259	.240	.223	.204	.186
1.04	.287	.275	.263	.255	.236	.219	.200	.182
1.05	.284	.271	.259	.251	.232	.215	.196	.178
1.06	.280	.268	.256	.248	.229	.211	.192	.174
1.07	.276	.264	.252	.244	.225	.207	.188	.170
1.08	.273	.260	.248	.241	.221	.203	.185	.166
1.09	.269	.257	.245	.237	.218	.200	.181	.162
1.10	.266	.254	.241	.233	.214	.196	.177	.158
1.11	.263	.250	.238	.230	.211	.193	.174	.155
1.12	.259	.246	.234	.226	.207	.189	.170	.151
1.13	.256	.243	.231	.223	.204	.186	.167	.148
1.14	.253	.240	.228	.220	.200	.183	.164	.145
1.15	.250	.238	.225	.217	.197	.179	.160	.142
1.16	.247	.235	.222	.214	.194	.176	.157	.138
1.17	.244	.232	.219	.211	.191	.173	.154	.135
1.18	.241	.229	.216	.208	.187	.170	.151	.132
1.19	.238	.226	.213	.205	.184	.167	.148	.129
1.20	.235	.223	.210	.202	.181	.163	.145	.126
1.21	.232	.220	.207	.198	.178	.160	.142	.123
1.22	.229	.217	.204	.195	.175	.157	.139	.120
1.23	.227	.214	.201	.193	.171	.154	.136	.117
1.24	.224	.211	.199	.190	.168	.151	.133	.114
1.25	.221	.209	.196	.187	.166	.149	.130	.112

R - Ratio of Maximum Rated Losses to Expected Losses

Note: See sheet 6 for notes on interpolation.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN I

TABLE A Sheet 5

Table of Charges for Losses in Excess of Ratio R

(Charges Expressed as Ratios to Expected Losses)

Ratio R	Risk Expected Losses							
	$7,000	$8,000	$9,000	$10,000	$12,500	$15,000	$20,000	$25,000
1.26	.219	.206	.195	.184	.165	.146	.128	.109
1.27	.216	.203	.190	.181	.160	.143	.125	.106
1.28	.214	.201	.188	.179	.157	.140	.122	.104
1.29	.211	.198	.185	.176	.154	.137	.119	.101
1.30	.208	.195	.182	.173	.152	.134	.117	.099
1.31	.206	.193	.179	.170	.149	.131	.114	.097
1.32	.204	.190	.177	.168	.146	.129	.112	.094
1.33	.201	.188	.175	.166	.144	.127	.109	.092
1.34	.199	.185	.172	.163	.142	.124	.107	.090
1.35	.196	.183	.169	.160	.139	.122	.105	.088
1.36	.194	.180	.166	.157	.136	.120	.103	.086
1.37	.192	.178	.164	.155	.134	.117	.100	.084
1.38	.190	.176	.162	.153	.131	.115	.098	.082
1.39	.187	.173	.159	.150	.129	.113	.096	.080
1.40	.185	.171	.157	.148	.127	.111	.094	.078
1.41	.183	.168	.154	.146	.125	.109	.092	.076
1.42	.181	.166	.152	.143	.123	.106	.090	.074
1.43	.179	.164	.150	.141	.121	.104	.088	.072
1.44	.177	.162	.148	.139	.119	.102	.086	.070
1.45	.175	.160	.146	.137	.117	.100	.084	.068
1.46	.173	.158	.144	.135	.115	.098	.082	.067
1.47	.171	.156	.142	.133	.113	.096	.081	.065
1.48	.169	.154	.140	.131	.111	.094	.079	.064
1.49	.167	.152	.138	.129	.109	.092	.077	.062
1.50	.165	.150	.136	.127	.107	.091	.076	.060
1.52	.161	.147	.132	.124	.104	.087	.073	.058
1.54	.158	.144	.129	.121	.101	.084	.070	.055
1.56	.155	.140	.126	.118	.098	.081	.067	.052
1.58	.152	.137	.122	.114	.094	.078	.064	.050
1.60	.148	.133	.119	.111	.091	.075	.061	.048
1.62	.145	.130	.116	.108	.088	.072	.059	.045
1.64	.142	.128	.114	.105	.085	.069	.056	.043
1.66	.140	.125	.111	.103	.083	.066	.054	.041
1.68	.137	.122	.108	.100	.081	.064	.052	.039
1.70	.134	.119	.105	.097	.078	.062	.050	.038
1.72	.131	.117	.102	.094	.075	.060	.048	.036
1.74	.129	.114	.100	.092	.073	.058	.046	.034
1.76	.126	.111	.097	.090	.071	.055	.044	.033
1.78	.123	.109	.095	.087	.069	.053	.042	.031
1.80	.121	.107	.092	.085	.067	.052	.041	.030
1.82	.119	.104	.090	.082	.065	.050	.040	.029
1.84	.116	.102	.088	.080	.063	.048	.038	.028
1.86	.114	.100	.085	.078	.061	.047	.037	.027
1.88	.112	.097	.083	.076	.059	.045	.035	.025
1.90	.109	.095	.081	.074	.056	.043	.034	.024

R - Ratio of Maximum Rated Losses to Expected Losses

Note: See sheet 6 for notes on interpolation.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN I

TABLE A

Sheet 6

Table of Charges for Losses in Excess of Ratio R

(Charges Expressed as Ratios to Expected Losses)

R - Ratio of Maximum Rated Losses to Expected Losses	Ratio R	Risk Expected Losses							
		$7,000	$8,000	$9,000	$10,000	$12,500	$15,000	$20,000	$25,000
	1.92	.107	.093	.079	.072	.054	.041	.032	.023
	1.94	.105	.091	.077	.070	.053	.040	.031	.022
	1.96	.103	.089	.075	.068	.051	.038	.029	.021
	1.98	.101	.087	.073	.066	.049	.037	.028	.020
	2.00	.099	.085	.071	.064	.047	.035	.027	.019
	2.02	.096	.083	.069	.062	.046	.034	.026	.019
	2.04	.094	.081	.068	.061	.044	.033	.025	.018
	2.06	.093	.079	.066	.059	.042	.031	.024	.017
	2.08	.091	.077	.064	.057	.041	.030	.023	.016
	2.10	.089	.075	.062	.055	.039	.029	.022	.015
	2.12	.087	.074	.061	.054	.038	.028	.021	.014
	2.14	.085	.072	.059	.052	.037	.027	.020	.014
	2.16	.083	.070	.058	.051	.036	.026	.019	.013
	2.18	.081	.068	.056	.050	.034	.025	.019	.013
	2.20	.079	.067	.054	.048	.033	.024	.018	.012
	2.22	.078	.065	.053	.047	.032	.023	.017	.012
	2.24	.076	.063	.051	.045	.031	.022	.016	.011
	2.26	.074	.062	.050	.044	.030	.021	.016	.010
	2.28	.073	.061	.048	.042	.029	.021	.015	.010
	2.30	.071	.059	.047	.041	.028	.020	.015	.010
	2.32	.069	.057	.045	.039	.027	.019	.014	.009
	2.34	.068	.056	.044	.038	.026	.019	.014	.009
	2.36	.067	.055	.043	.037	.025	.018	.013	.008
	2.38	.065	.053	.042	.036	.024	.018	.013	.008
	2.40	.064	.052	.040	.035	.024	.017	.012	.008
	2.42	.062	.051	.039	.034	.023	.016	.012	.007
	2.44	.061	.049	.038	.033	.022	.015	.011	.007
	2.46	.060	.048	.037	.032	.022	.015	.011	.007
	2.48	.058	.047	.036	.032	.021	.015	.010	.006
	2.50	.057	.046	.035	.031	.021	.014	.010	.006
	2.55	.054	.044	.033	.029	.019	.013	.009	.005
	2.60	.052	.042	.031	.027	.017	.012	.008	.005
	2.65	.049	.040	.029	.025	.016	.011	.007	.004
	2.70	.047	.038	.028	.024	.015	.010	.007	.004
	2.75	.045	.036	.026	.023	.014	.009	.006	.003
	2.80	.043	.034	.025	.021	.013	.008	.005	.003
	2.85	.041	.032	.023	.020	.012	.007	.005	.002
	2.90	.039	.031	.022	.019	.011	.006	.004	.002
	2.95	.038	.030	.022	.019	.011	.006	.004	.002
	3.00	.037	.029	.021	.018	.010	.006	.004	.002

Note: If the selected ratio to expected losses is between two successive ratios shown in the Ratio R. column, the charge for the higher of the two ratios shall apply. The charge shall be interpolated for risk expected losses lying between two successive expected loss amounts appearing in the table. If the risk expected losses are in excess of $25,000, use the $25,000 column. If the risk expected losses are below $500, refer to the rating organization.

Appendix II

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN Sheet 1

TABLE B

Table of Savings in Losses Below Ratio S

(Savings Expressed as Ratios to Expected Losses)

Ratio S	Risk Expected Losses							
	$500	$1,000	$1,500	$2,000	$3,000	$4,000	$5,000	$6,000
.01	.001	.001	.001	.000	-	-	-	-
.02	.003	.002	.001	.001	-	-	-	-
.03	.004	.002	.001	.001	-	-	-	-
.04	.006	.004	.002	.001	-	-	-	-
.05	.009	.005	.003	.002	-	-	-	-
.06	.011	.007	.005	.003	.001	-	-	-
.07	.014	.008	.006	.004	.001	.001	-	-
.08	.017	.010	.007	.005	.002	.001	.001	.001
.09	.020	.011	.008	.006	.002	.001	.001	.001
.10	.023	.013	.009	.007	.003	.002	.001	.001
.11	.027	.015	.010	.008	.004	.003	.002	.002
.12	.030	.017	.012	.009	.005	.004	.003	.002
.13	.033	.019	.013	.010	.006	.004	.003	.002
.14	.037	.022	.015	.011	.007	.005	.004	.002
.15	.040	.024	.016	.013	.008	.006	.004	.003
.16	.044	.026	.018	.014	.009	.006	.004	.003
.17	.048	.028	.019	.015	.010	.007	.005	.003
.18	.052	.030	.021	.017	.012	.008	.006	.004
.19	.056	.033	.023	.018	.014	.010	.007	.005
.20	.060	.036	.025	.020	.016	.011	.008	.006
.21	.064	.038	.027	.022	.017	.012	.008	.006
.22	.068	.042	.029	.024	.019	.013	.009	.006
.23	.073	.045	.032	.026	.021	.015	.011	.008
.24	.079	.049	.035	.029	.023	.017	.012	.009
.25	.083	.053	.039	.032	.026	.019	.014	.010
.26	.087	.057	.042	.035	.028	.021	.016	.012
.27	.092	.061	.046	.038	.030	.023	.017	.013
.28	.097	.065	.050	.041	.032	.025	.018	.014
.29	.102	.069	.053	.044	.034	.027	.020	.015
.30	.107	.074	.057	.047	.037	.029	.022	.017
.31	.112	.078	.061	.050	.040	.031	.024	.019
.32	.117	.083	.065	.053	.042	.034	.026	.021
.33	.122	.087	.069	.056	.045	.036	.028	.022
.34	.128	.092	.073	.060	.048	.038	.031	.024
.35	.133	.097	.077	.064	.051	.041	.033	.027
.36	.138	.102	.081	.068	.054	.044	.036	.029
.37	.143	.107	.086	.072	.057	.047	.038	.031
.38	.149	.112	.090	.076	.060	.050	.041	.034
.39	.154	.117	.094	.079	.063	.053	.044	.036
.40	.160	.122	.098	.083	.067	.056	.047	.039

S - Ratio of Minimum Rated Losses to Expected Losses

Note: See sheet 6 for notes on interpolation.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN I Sheet 2

TABLE B

Table of Savings in Losses Below Ratio S

(Savings Expressed as Ratios to Expected Losses)

S - Ratio of Minimum Rated Losses to Expected Losses	Ratio S	Risk Expected Losses							
		$500	$1,000	$1,500	$2,000	$3,000	$4,000	$5,000	$6,000
	.41	.166	.127	.103	.087	.070	.059	.049	.041
	.42	.172	.132	.108	.091	.073	.062	.052	.044
	.43	.177	.138	.112	.095	.076	.065	.055	.046
	.44	.183	.143	.117	.100	.080	.068	.058	.049
	.45	.189	.149	.122	.104	.083	.071	.061	.052
	.46	.195	.154	.127	.108	.086	.074	.064	.055
	.47	.201	.159	.131	.112	.090	.078	.067	.059
	.48	.206	.165	.136	.117	.094	.082	.071	.062
	.49	.212	.170	.141	.122	.098	.086	.075	.066
	.50	.218	.176	.147	.127	.103	.090	.079	.070
	.51	.224	.181	.152	.132	.107	.094	.083	.073
	.52	.230	.186	.157	.137	.111	.098	.086	.077
	.53	.236	.192	.162	.142	.116	.102	.090	.080
	.54	.242	.197	.167	.147	.120	.106	.094	.084
	.55	.248	.203	.173	.152	.125	.110	.098	.087
	.56	.254	.208	.178	.158	.130	.115	.102	.091
	.57	.261	.214	.183	.163	.134	.119	.106	.095
	.58	.267	.219	.189	.168	.139	.123	.110	.099
	.59	.273	.225	.194	.173	.144	.128	.114	.103
	.60	.280	.231	.200	.179	.149	.132	.118	.107
	.61	.286	.237	.206	.185	.154	.137	.123	.111
	.62	.292	.243	.212	.190	.159	.142	.127	.115
	.63	.299	.249	.217	.196	.164	.146	.131	.119
	.64	.305	.255	.223	.201	.168	.150	.135	.123
	.65	.312	.261	.229	.207	.173	.154	.139	.127
	.66	.318	.267	.235	.213	.178	.159	.144	.132
	.67	.324	.273	.241	.218	.183	.164	.148	.136
	.68	.331	.279	.247	.224	.189	.169	.153	.141
	.69	.337	.285	.253	.230	.194	.174	.158	.145
	.70	.344	.291	.258	.235	.199	.179	.162	.149
	.71	.350	.297	.264	.241	.204	.184	.167	.154
	.72	.356	.303	.270	.246	.209	.189	.172	.158
	.73	.363	.309	.276	.252	.215	.194	.177	.163
	.74	.370	.315	.282	.258	.220	.199	.182	.168
	.75	.377	.321	.287	.264	.226	.205	.187	.172
	.76	.383	.327	.293	.270	.232	.210	.192	.177
	.77	.390	.333	.299	.275	.237	.216	.198	.182
	.78	.397	.339	.305	.281	.243	.221	.203	.187
	.79	.404	.345	.311	.287	.248	.227	.208	.192
	.80	.411	.351	.316	.293	.253	.232	.213	.197

Note: See sheet 6 for notes on interpolation.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN I Sheet 3

TABLE B

Table of Savings in Losses Below Ratio S

(Savings Expressed as Ratios to Expected Losses)

S - Ratio of Minimum Rated Losses to Expected Losses	Ratio S	Risk Expected Losses							
		$500	$1,000	$1,500	$2,000	$3,000	$4,000	$5,000	$6,000
	.81	.418	.357	.322	.299	.259	.237	.218	.202
	.82	.425	.363	.328	.304	.264	.242	.223	.207
	.83	.432	.370	.334	.310	.270	.248	.229	.213
	.84	.439	.376	.340	.316	.276	.253	.234	.218
	.85	.446	.383	.346	.322	.282	.259	.240	.224
	.86	.453	.389	.353	.328	.288	.265	.246	.230
	.87	.460	.396	.359	.334	.294	.271	.252	.236
	.88	.468	.402	.365	.339	.300	.277	.257	.241
	.89	.475	.409	.371	.345	.306	.283	.263	.247
	.90	.483	.416	.377	.351	.312	.289	.269	.253
	.91	.490	.422	.383	.357	.318	.295	.275	.259
	.92	.498	.429	.389	.363	.325	.301	.281	.265
	.93	.505	.435	.395	.369	.331	.307	.287	.270
	.94	.513	.442	.402	.376	.338	.313	.293	.276
	.95	.520	.449	.408	.382	.345	.320	.299	.283
	.96	.528	.456	.415	.389	.351	.326	.306	.289
	.97	.535	.463	.422	.395	.358	.332	.312	.295
	.98	.543	.470	.429	.402	.365	.339	.318	.301
	.99	.550	.477	.436	.409	.372	.346	.324	.308
	1.00	.558	.484	.443	.416	.379	.352	.331	.314

Note: See sheet 6 for notes on interpolation.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN I Sheet 4

TABLE B

Table of Savings in Losses Below Ratio S

(Savings Expressed as Ratios to Expected Losses)

S - Ratio of Minimum Rated Losses to Expected Losses: Ratio S	Risk Expected Losses							
	$7,000	$8,000	$9,000	$10,000	$12,500	$15,000	$20,000	$25,000
Below .08	-	-	-	-	-	-	-	-
.08	.001	.001	.001	.001	.001	.001	.001	-
.09	.001	.001	.001	.001	.001	.001	.001	-
.10	.001	.001	.001	.001	.001	.001	.001	-
.11	.002	.002	.002	.001	.001	.001	.001	-
.12	.002	.002	.002	.002	.001	.001	.001	-
.13	.002	.002	.002	.002	.001	.001	.001	-
.14	.002	.002	.002	.002	.001	.001	.001	-
.15	.003	.002	.002	.002	.001	.001	.001	-
.16	.003	.002	.002	.002	.001	.001	.001	-
.17	.003	.002	.002	.002	.001	.001	.001	-
.18	.003	.003	.002	.002	.001	.001	.001	-
.19	.004	.003	.002	.002	.001	.001	.001	-
.20	.005	.004	.003	.003	.002	.001	.001	-
.21	.005	.004	.003	.003	.002	.001	.001	-
.22	.005	.004	.003	.003	.002	.001	.001	-
.23	.006	.005	.004	.003	.002	.001	.001	-
.24	.007	.006	.004	.004	.002	.001	.001	-
.25	.008	.007	.005	.004	.003	.002	.001	.001
.26	.010	.008	.006	.005	.003	.003	.002	.001
.27	.011	.009	.007	.006	.004	.003	.002	.001
.28	.012	.010	.008	.007	.005	.004	.002	.001
.29	.013	.011	.009	.008	.006	.005	.003	.002
.30	.015	.013	.011	.010	.007	.006	.004	.003
.31	.017	.015	.013	.012	.009	.007	.005	.003
.32	.019	.017	.014	.013	.011	.008	.006	.004
.33	.020	.018	.015	.014	.012	.009	.007	.005
.34	.022	.019	.017	.016	.013	.011	.008	.006
.35	.024	.021	.019	.018	.015	.012	.009	.007
.36	.026	.023	.021	.020	.017	.013	.010	.007
.37	.028	.025	.022	.021	.018	.014	.011	.008
.38	.031	.027	.024	.023	.020	.015	.012	.009
.39	.033	.029	.026	.025	.021	.016	.013	.009
.40	.035	.031	.028	.026	.023	.017	.013	.010
.41	.037	.033	.030	.028	.024	.018	.014	.010
.42	.039	.035	.032	.030	.026	.019	.015	.011
.43	.042	.038	.034	.032	.028	.021	.017	.013
.44	.045	.040	.036	.034	.029	.023	.018	.014
.45	.048	.043	.038	.037	.031	.025	.020	.015

Note: See sheet 6 for notes on interpolation.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN I Sheet 5

TABLE B

Table of Savings in Losses Below Ratio S

(Savings Expressed as Ratios to Expected Losses)

S - Ratio of Minimum Rated Losses to Expected Losses: Ratio S	Risk Expected Losses							
	$7,000	$8,000	$9,000	$10,000	$12,500	$15,000	$20,000	$25,000
.46	.051	.046	.040	.039	.033	.026	.021	.016
.47	.054	.048	.043	.041	.035	.028	.023	.017
.48	.057	.051	.046	.043	.037	.030	.024	.018
.49	.060	.054	.048	.046	.039	.032	.026	.020
.50	.064	.057	.051	.048	.041	.034	.027	.021
.51	.067	.060	.054	.051	.043	.035	.029	.022
.52	.070	.063	.056	.053	.045	.037	.030	.023
.53	.073	.066	.059	.056	.047	.039	.032	.025
.54	.076	.069	.062	.059	.049	.041	.034	.026
.55	.080	.073	.065	.061	.052	.043	.036	.028
.56	.084	.076	.068	.064	.054	.046	.038	.029
.57	.088	.080	.072	.067	.056	.048	.040	.031
.58	.091	.083	.075	.070	.059	.051	.042	.033
.59	.095	.087	.079	.073	.062	.053	.044	.035
.60	.099	.090	.082	.077	.064	.055	.046	.037
.61	.103	.094	.086	.080	.067	.058	.048	.039
.62	.106	.098	.089	.083	.070	.060	.051	.041
.63	.110	.101	.092	.086	.073	.063	.053	.043
.64	.114	.105	.096	.089	.076	.065	.056	.046
.65	.118	.109	.099	.093	.079	.068	.058	.048
.66	.122	.113	.103	.097	.082	.071	.061	.051
.67	.127	.117	.107	.101	.085	.074	.064	.053
.68	.131	.121	.111	.105	.089	.078	.067	.057
.69	.135	.125	.115	.109	.093	.081	.070	.060
.70	.139	.129	.119	.112	.097	.084	.073	.063
.71	.143	.133	.123	.116	.100	.088	.077	.066
.72	.148	.138	.127	.120	.104	.091	.080	.069
.73	.153	.142	.132	.125	.108	.095	.083	.072
.74	.157	.147	.136	.129	.112	.099	.087	.075
.75	.162	.151	.141	.133	.116	.103	.091	.079
.76	.166	.156	.145	.137	.120	.107	.095	.083
.77	.171	.160	.149	.142	.124	.111	.099	.086
.78	.176	.165	.154	.147	.129	.115	.103	.090
.79	.181	.170	.159	.151	.134	.120	.107	.094
.80	.186	.175	.163	.156	.139	.124	.111	.098
.81	.191	.180	.168	.161	.143	.129	.116	.103
.82	.196	.185	.173	.166	.148	.134	.120	.107
.83	.201	.190	.179	.171	.154	.139	.125	.111
.84	.207	.195	.184	.177	.159	.144	.130	.116
.85	.212	.201	.189	.182	.164	.149	.135	.121

Note: See sheet 6 for notes on interpolation.

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLAN I Sheet 6

TABLE B

Table of Savings in Losses Below Ratio S

(Savings Expressed as Ratios to Expected Losses)

S - Ratio of Minimum Rated Losses to Expected Losses	Ratio S	Risk Expected Losses							
		$7,000	$8,000	$9,000	$10,000	$12,500	$15,000	$20,000	$25,000
	.86	.218	.206	.194	.187	.169	.155	.140	.125
	.87	.224	.212	.200	.192	.175	.160	.145	.130
	.88	.229	.217	.205	.198	.180	.165	.150	.134
	.89	.235	.223	.211	.204	.186	.170	.155	.139
	.90	.241	.229	.217	.210	.192	.176	.160	.144
	.91	.247	.235	.223	.216	.198	.182	.166	.149
	.92	.253	.241	.229	.221	.204	.188	.171	.154
	.93	.258	.246	.234	.227	.209	.193	.177	.160
	.94	.264	.252	.240	.233	.215	.199	.182	.165
	.95	.270	.258	.246	.239	.221	.205	.188	.170
	.96	.276	.264	.252	.245	.227	.211	.193	.176
	.97	.282	.270	.258	.251	.233	.217	.199	.181
	.98	.289	.276	.264	.257	.239	.223	.205	.187
	.99	.295	.283	.271	.263	.245	.229	.210	.192
	1.00	.302	.289	.277	.269	.251	.234	.216	.198

Note: If the selected ratio to expected losses is between two successive ratios shown in the Ratio S column, the saving for the higher of the two ratios shall apply.
The saving shall be interpolated for risk expected losses lying between two successive expected loss amounts appearing in the table. If the risk expected losses are in excess of $25,000, use the $25,000 column. If the risk expected losses are below $500, refer to the rating organization

Sheet 1

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLANS

TABLE C

Expected Loss Factors

Type of Object	Expected Loss Factor*	Type of Object	Expected Loss Factor*
Oil or Gas Drilling Boilers	34%ø	Steam Engines	38%
Track Locomotive Boilers	7 ø	Reciprocating Compressors-Steam Type	39
Steel Boilers Class 1, H and S	4 ø	Reciprocating Pumps-Steam Type	21
Fire Tube Boilers over 15 lbs.Pressure	9 ø	Internal Combustion Engines	40
		Reciprocating Compressors and Pumps-Internal Combustion Type	25
Water Tube Boilers over 15 lbs.Pressure		Reciprocating Compressors and Pumps-Separately Driven Type	29
4000 sq. ft. or less	9 ø	Centrifugal or Rotary Pumps - except Deep Well	16
4001 - 10,000 sq. ft.	14 ø	Centrifugal or Rotary Compressors	34
Over 10,000 sq. ft.	19 ø	Centrifugal Pumps - Deep Well Type	26
Cast Iron Boilers	4 ø	Fans and Blowers	33
Fired Objects - N.O.C.	14 ø	Miscellaneous Machines	
Unfired Vessels - Type 1	8	Type 1	19
Type 2	8	Type 2 - Enclosed Gear Sets	38
Type 3	8	- Gear Wheels	33
Type 4	12	- Other	33
Type 5	14	Type 3	38
Refrigerating Vessels and Piping		Wheels	
Compression Type	31	Type 1	16
Absorption Type	28	Type 2	16
Boiler Piping	†	Type 3	24
		Shafting	39
Auxiliary Piping		Steam or Water Turbines - Breakdown - Driven Electric Generators	
Exhaust Piping	24	100 kw. or less	26
Other Auxiliary Piping	24	101 - 1000 kw.	31
Residence Boilers and Vessels		1001 - 9000 kw.	36
Blanket Coverage	23	Over 9000 kw.	41
Explosion Only Policy	49		
Furnace Explosion	49	Steam or Water Turbines - Breakdown - Other Driven Objects	
Indirect Insurance, Boiler	44	100 kw. or less	21
		101 - 1000 kw.	27
		1001 - 9000 kw.	32
		Over 9000 kw.	38

*The factor to obtain the inspection cost provision is 49% minus the expected loss factor for the object involved.

øStandard Coverage only - for Broad Coverage add 40% of the difference between Object Rates for Broad and Standard Coverage.

†Same expected loss factor as the Object determining the rate.

February 1, 1952

BOILER AND MACHINERY PREMIUM ADJUSTMENT RATING PLANS

TABLE C

Expected Loss Factors

Type of Object	Expected Loss Factor*	Type of Object	Expected Loss Factor*
Steam or Water Turbines - Limited Breakdown		Synchronous or Rotary Converters & Dynamotors	
100 kw. or less	20%	100 kw. or less	30%
101 - 1000 kw.	25	101 - 1000 kw.	35
1001 - 9000 kw.	30	Over 1000 kw.	40
Over 9000 kw.	35		
Steam or Water Turbines - Combined Coverage		Transformers & Induction Feeder Regulators	
100 kw. or less	20	25 kw. or kva. or less	15
101 - 1000 kw.	25	26 - 200 kw. or kva.	25
1001 - 9000 kw.	30	201 - 1000 kw. or kva.	35
Over 9000 kw.	35	Over 1000 kw. or kva.	39
Steam or Water Turbines - Explosion Coverage		Deep-Well Pump Units	34
100 kw. or less	5	Small Refrigerating Machines	15
101 - 1000 kw.	11	Small Compressing Machines	9
1001 - 9000 kw.	16		
Over 9000 kw.	21		
Electric Generators		Air Conditioners	20
100 kw. or less	20	Miscellaneous Electrical Apparatus	25
101 - 1000 kw.	29	Indirect Insurance, Machinery	44
1001 - 9000 kw.	34		
Over 9000 kw.	39		
Electric Motors and Synchronous or Rotary Condensers		Premium from Application of Location Charges, Portable Object Charges and Excess Limit Factors	12
5 h. p. or less	15		
6 - 25 h.p.	26		
26 - 100 h.p.	31		
101 - 1000 h.p.	36		
Over 1000 h.p.	41		

*The factor to obtain the inspection cost provision is 49% minus the expected loss factor for the object involved.

February 1, 1952