The city of Milwaukee's Sample Preventative maintenance manual for Electronically monitored boilers

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INTRODUCTION

Preventative maintenance of boiler components is required to maintain them in good working condition and to assure safety.

The primary objective of any PM System is to provide for managing maintenance and maintenance support in a manner, which will ensure maximum equipment readiness.

The intermediate objectives of the PM System is as follows:

a) Documenting information relating to maintenance and maintenance support actions.

b) Improvement of maintainability and reliability of systems and equipment by provision of documented maintenance information for analysis.

c) Provide the means to schedule, plan, manage, and track maintenance.

d) Provide data on which to base improvements in system.

Adequate precautions should be taken while maintenance is being performed to protect personnel (performing the work), building occupants, and the equipment.

Intention

It is not intended that this manual serve as operating instructions for any specific plant. Due to the wide variety of types and makes of equipment used, this guide should be supplemented with manufacturer's recommendations concerning the maintenance and care of your system. Specific written operating and maintenance instructions should be supplied.

City of Milwaukee

Boiler Inspection Division
Sample Letterhead

Corporate Authority Letter

Date: (today)

Our company has been furnished a copy of the city of Milwaukee code for boiler Electronic Monitoring systems. We have read the code and assume responsibility for complying with it and its preventative maintenance requirements.

The boiler preventative maintenance is an integrated maintenance management system which operates under the guidance of (enter name), which has been assigned overall responsibility for the development, coordination, and maintenance of said system. Refer to the documents "Organizational Relationship - Chain of Responsibility" and "Boiler room repair progression"

Boilers are located at: Company Name
Company Address
State Registration Number

The personnel listed below are responsible for the duties indicated.

Engineering manager; is responsible for the overall boiler preventative maintenance program and ensuring that an analysis program is carried out.(list duties)

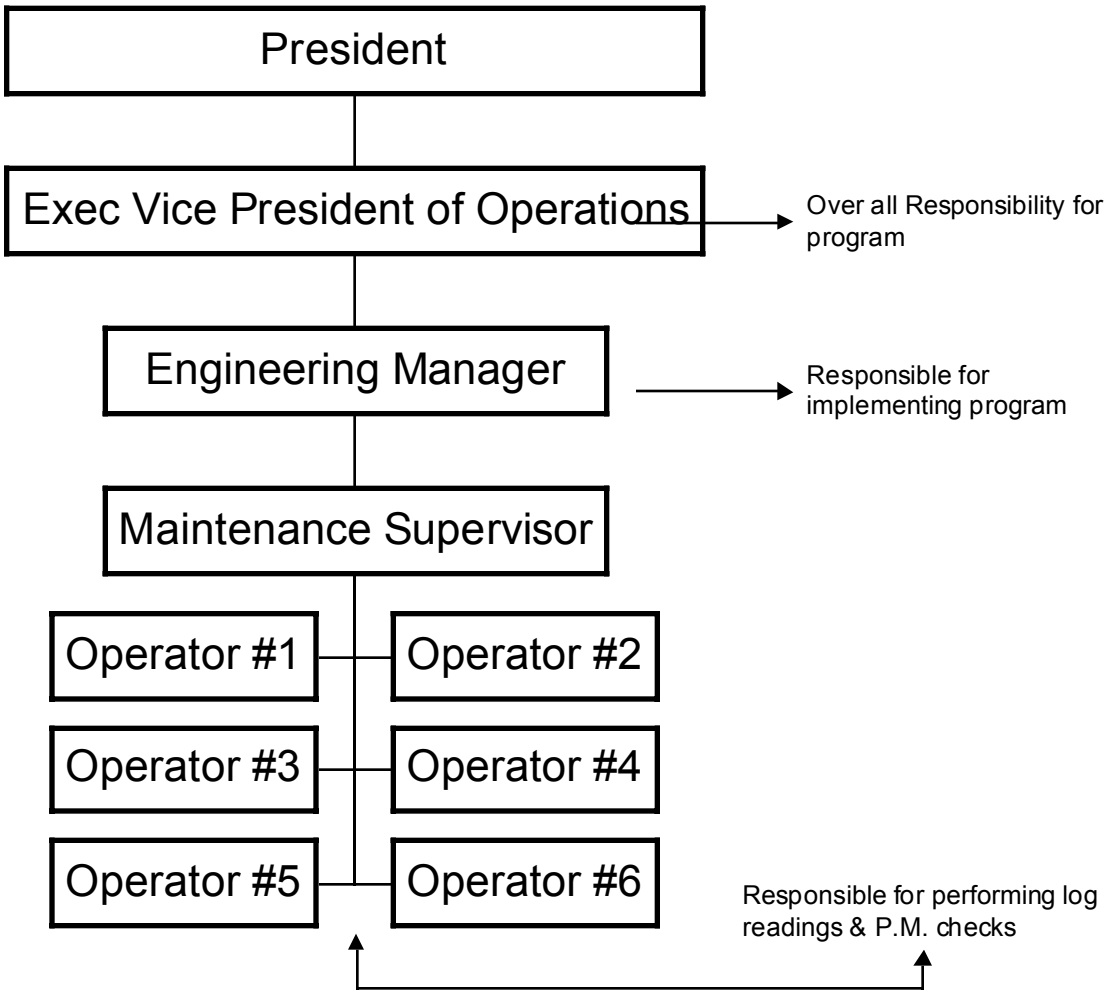
Maintenance supervisor; is responsible for implementing the boiler preventative maintenance and analysis programs.(List duties)

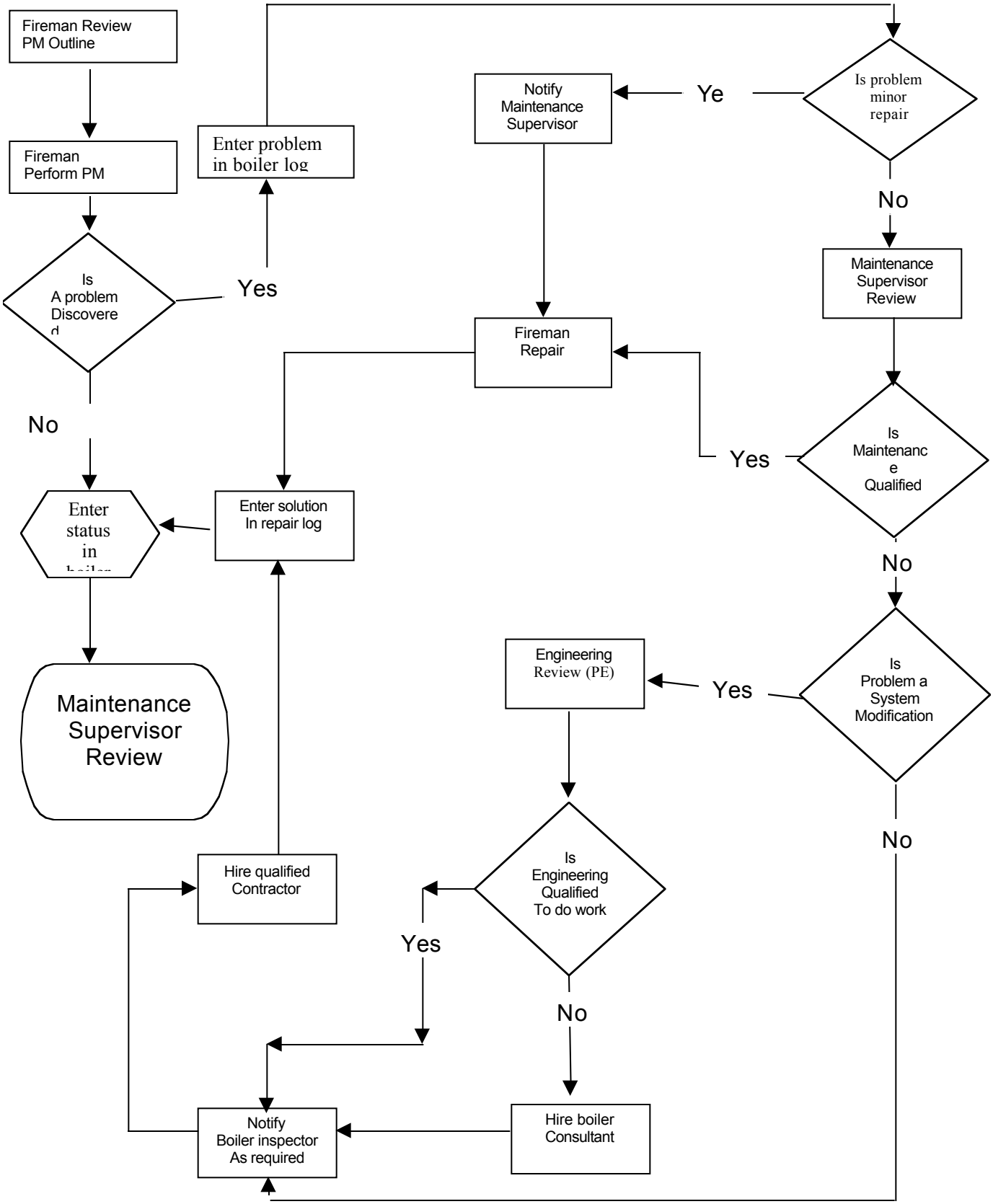
Boiler operator; is responsible for performing log readings and preventative maintenance checks. (List duties)

Approved by: (signature and title of a corporate officer)

Organizational Relationships

Chain of Responsibility for boilers at:





Boiler Room Repair Progression

Daily Checklist

	Blow down and test low water cut-offs
	Blow down gage glasses
	Blow down boiler
	Check boiler and system for leaks
	Check burner flame

Note: The above checklist should be referenced to specific written procedures. In all cases the equipment manufacturer's recommendations should be followed. This check off list uses ASME section VI and ASME CSD-1 for it's specific written instructions.

Weekly Checklist

	Check flame signal strength for both pilot and main flame
	Check pilot and main fuel shutoff valves closing
	Check igniter and burner operation
	Check level in chemical treatment tank

Note: The above checklist should be referenced to specific written procedures. In all cases the equipment manufacturer's recommendations should be followed. This check off list uses ASME section VI and ASME CSD-1 for it's specific written instructions.

Monthly Checklist

	Check boiler water treatment test results and adjust as necessary
	Lubricate motors and equipment bearings
	Test fan and air pressure interlocks
	Check main burner fuel safety shutoff valves for leakage
	Check low fire start interlock
	Check high pressure / temperature interlocks
	Check high and low pressure interlocks on gas train
	Manually lift safety valve by hand

Note: The above checklist should be referenced to specific written procedures. In all cases the equipment manufacturer's recommendations should be followed. This check off list uses ASME section VI and ASME CSD-1 for it's specific written instructions.

Semiannually Checklist

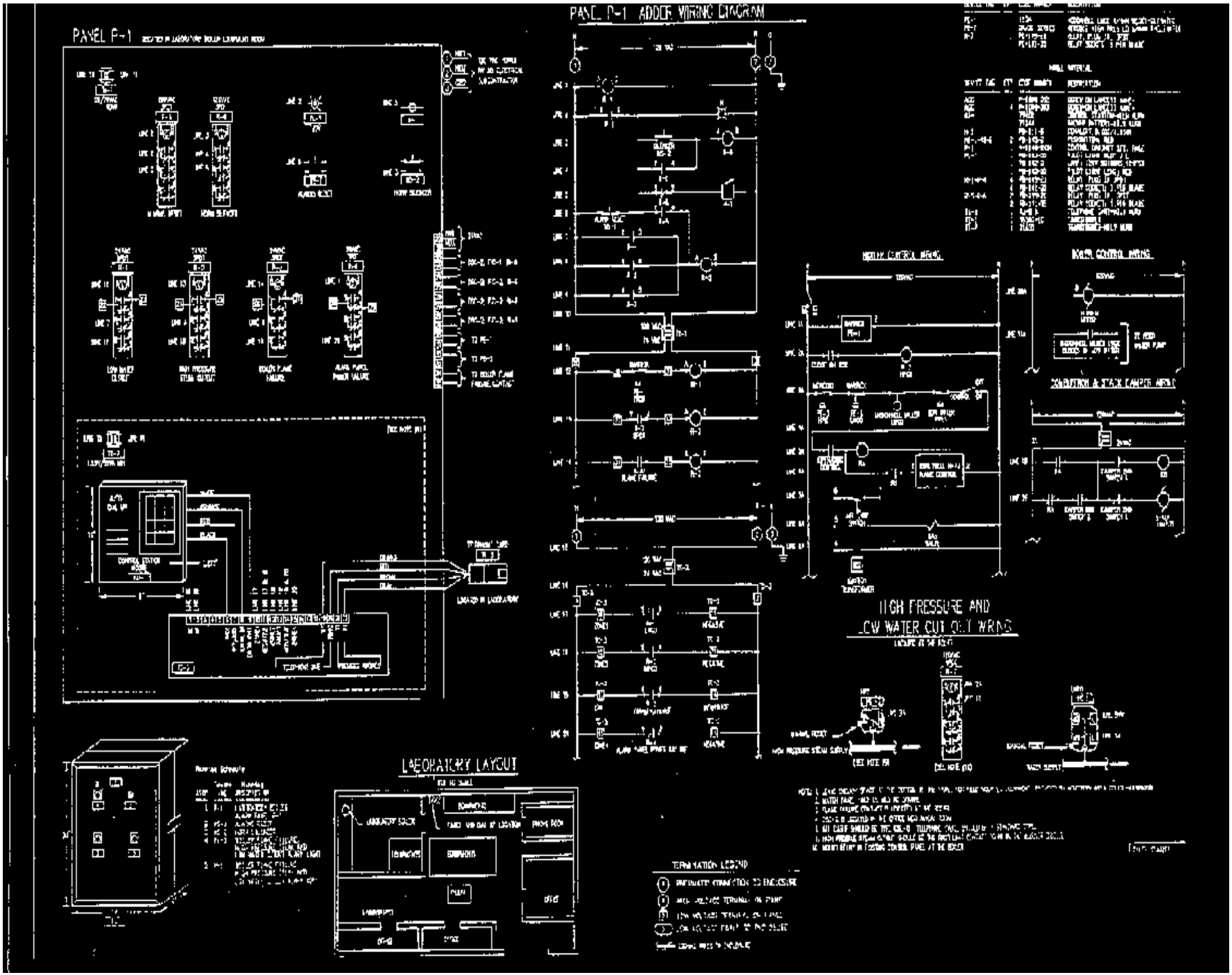
	Inspect burner components
	Check flame failure system components
	Check piping and wiring of all interlocks and shutoff valves
	Recalibrate all instruments, indicating and recording gages
	Perform a slow drain test for low water cut-off
	Check combustion control system
	Check oil atomizers and strainers
	Test boiler safety valves according to ASME

Note: The above checklist should be referenced to specific written procedures. In all cases the equipment manufacturer's recommendations should be followed. This check off list uses ASME section VI and ASME CSD-1 for it's specific written instructions.

Annual Checklist

	Perform the semiannual
	Check all equipment coils and diaphragms
	Perform a pilot turndown test
	Recondition or replace low water cut-off
	Check gas drip leg and gas strainer
	Clean boiler firesides
	Drain boiler, open manholes, handholes, and clean water sides
	Have boiler inspected by a commissioned inspector
	Clean burner and fans
	Replace gaskets
	Leak test all fuel valves
	Test operation of all controls and safety devices
	Adjust combustion
	Test and re-certify boiler monitoring system

Note: The above checklist should be referenced to specific written procedures. In all cases the equipment manufacturer's recommendations should be followed. This check off list uses ASME section VI and ASME CSD-1 for it's specific written instructions.


PANEL P-1
PANEL P-1 ADDER WIRING DIAGRAM
HIGH CONTROL WIRING
LOW CONTROL WIRING
COMBUSTION & STACK DAMPER WIRING
HIGH PRESSURE AND
LOW WATER CUT OUT WIRING
LABORATORY LAYOUT
TERMINATION LEGEND

City of
Milwaukee
Building Inspection
Boiler Section 286-2514

BOILER LOG

MAINTENANCE, TESTING, AND INSPECTION LOG STEAM HEATING BOILERS	Building:	Month:	Year:
	Address:	Fuel Type:	
Person(s) to be notified in Emergency (Name and Telephone No.)		Boiler No.:	

DAILY CHECKS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Observe Water Level																															
Record Pressure																															
Record Flue Gas Temperature																															
Daily Preventative Maintenance Checks																															

WEEKLY CHECKS (Enter Date)

	WEEK 1	WEEK 2	WEEK 3	WEEK 4
Test Low Water Cutoff				
Test Gage Glass				
Observe Flame Condition				
Weekly Preventative Maintenance Checks				

MONTHLY CHECKS (Enter Date)

Manual Lift Safety Valve		**Semi-Annual CHECKS (Enter Date)**		
Review Condition of or Test Each Item	Linkages		Floor Drains	
	Damper Controls		Flame Detection Device	
	Stop Valves		Limit Controls	
	Refractory		Operating Controls	
	Flue-Chimney Breaching			
Inspect Fuel Piping				
Combustion Air				
Adequate/Unobstructed				
Semi-Annual Prev. Main.CHECKS (Enter Date)			**Annual Prev. Main.CHECKS (Enter Date)**	

GENERAL COMMENTS

BI TNW 1/17/95 V1.0

Mechanical repair log

Date	Boiler/Fireman Approved by	Person doing work	Employed by	Description of work (Be precise)

BOILER MONITORING SYSTEMS

Location of Installation

Name

Address

City State Zip Code

Area Code Telephone Number

Person to Contact

TYPE OF MONITORING SYSTEM

__Low Pressure __High Pressure

ITEMS TO BE MONITORED ON BOILER

__Low Water	__With Alarm	__Manual Reset	__Visually Verified
__High Pressure	__With Alarm	__Manual Reset	__Visually Verified
__Flame Failure	__With Alarm	__Manual Reset	__Visually Verified
__Power Failure	__With Alarm	__Manual Reset	__Visually Verified
__Low Pressure or Temperature			__Visually Verified
__Dual Shut-Off Fuel Valves			__Visually Verified
__Remote Shut-Off Capabilities			__Visually Verified

LOCATION OF WIRING DIAGRAMS OF SYSTEM AND FAULT-FREE ANALYSIS OF SYSTEM:

Do not write below this line

DATE OF INSPECTION: _____ PERMIT NUMBER: _____

NUMBER OF BOILERS MONITORED BY SYSTEM: _____

COMMENTS: _____

INSPECTION AGENCY SIGNATURE INS CODE CERT NUMBER

BOILER MONITORING SYSTEMS

NAMES OF BOILER OPERATORS OR NAME OF RESPONDING COMPANY

(1)_____

(2)_____

(3)_____

(4)_____

NAMES OF COMPANIES INSTALLING OR HOOKING UP MONITORING SYSTEM

(1)_____

(2)_____

(3)_____

LOCATION OF WIRING DIAGRAMS OF SYSTEM AND FAULT-FREE ANALYSIS OF SYSTEM:

_____

_____

_____

_____

_____

HOW WILL EMERGENCY CALLS BE HANDLED?

_____

_____

_____

_____

_____

ELECTRONIC MONITORING SYSTEM OF BOILERS
CERTIFICATION--RECERTIFICATION FORM

TO: Commissioner of Building Inspection
Boiler Division, Room 1016
841 N Broadway
Milwaukee, WI 53202

_____
Inspection Date

_____
Expiration Date of Certification

SUBJECT: CERTIFICATION--RECERTIFICATION **(CIRCLE ONE)**

OF INSTALLATION AT: _____
Address

_____
Wisconsin Boiler Registration Number(s)

(If Installing)

I HEREBY CERTIFY THAT THE ELECTRONIC MONITORING SYSTEM(S) AT THE SUBJECT PREMISES IS INSTALLED AND OPERATING IN ACCORDANCE WITH THE CITY OF MILWAUKEE BUILDING CODE REQUIREMENTS FOR BOILERS AND ELECTRONIC MONITORING AS PER CHAPTER 223.

_____
Installing Company Name

_____
Address

_____
City State Zip

_____
Area Code Telephone Number

_____
Person to Contact

_____
Installer Signature

_____
Certifying Company Name

_____
Address

_____
City State Zip

_____
Area Code Telephone Number

_____
Person to Contact

_____
Professional Engineer's Signature and Seal

(If Re-certifying)

I HEREBY CERTIFY THAT I PERFORMED THE REQUIRED ANNUAL TESTING OF THE BOILER ELECTRONIC MONITORING SYSTEM IN ACCORDANCE WITH SECTION 223 AND FOUND THE SYSTEM OPERATING PROPERLY.

_____
Certifying Company Name

_____
Address

_____
City State Zip

_____
Area Code Telephone Number Person to Contact

_____
Certifying Company Signature

_____
Professional Engineer's Signature and Seal

Record of Revisions

Revision Number	Section number(s) revised and description	Date Issued

A current copy of this document will be kept with: engineering manager, maintenance supervisor, boiler room, and city of Milwaukee.