

DEPARTMENT OF ENVIRONMENTAL QUALITY  
 AIR QUALITY DIVISION  
 ACTIVITY REPORT: Scheduled Inspection

A186443468

FACILITY: INDUSTRIAL STEEL TREAT CO		SRN / ID: A1864
LOCATION: 613 CARROLL ST, JACKSON		DISTRICT: Jackson
CITY: JACKSON		COUNTY: JACKSON
CONTACT: Jim Matthews , Facilities Manager/Environmental		ACTIVITY DATE: 02/28/2018
STAFF: Mike Kovalchick	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MINOR
SUBJECT: Inspection of a heat treat facility.		
RESOLVED COMPLAINTS:		

**Minor Source: Inspection of Industrial Steel Treating located at 613 Carroll Street, Jackson, Michigan.**

State Registration Number (SRN): A1864

**Facility Contacts**

Jim Matthews (JM), Facilities Manager, 517-780-9032, [jwmatthews@indstl.com](mailto:jwmatthews@indstl.com).

**Purpose**

On February 28, 2018, I conducted a scheduled, unannounced inspection of the Industrial Steel Treating (IST) facility located in Jackson, Michigan (Jackson County) at 613 Carroll Street. The purpose of the inspection was to determine the facility's compliance status with applicable federal and state air pollution regulations, particularly with the Michigan Natural Resources and Environmental Protection Act 451 of 1994, Part 55, Air Pollution Control and the administrative rules, and the conditions of IST's Permit to Install (PTI) number 394-07A, issued on February 8, 2017. This facility last inspected on June 24, 2016.

**Facility Location**

The facility is located within the city limits of Jackson. It is immediately surrounded by a combination of other commercial / industrial sources and residential areas. Attachment (1) is an aerial photo of the facility showing the main building (East building) and a separate leased building located just West of the main building. (West building)

**Arrival & Facility Contacts**

No odors or visible emissions were observed upon my approach to the facility. I arrived at approximately 9:00 am, proceeded to the facility office to request access for an inspection, provided my identification to JM, and asked if anyone else was available to meet with me, etc. JM escorted me to his office and a pre-inspection conference was held. I informed JM of my intent to conduct a facility inspection and to review the various records required by their permit. JM extended his full cooperation during the inspection and he accompanied me during the site tour portion of the inspection.

**Regulatory Applicability**

The entire facility is considered a true minor source and is regulated by PTI 394-07A and reports its emissions to the Michigan Air Emissions Reporting System (MAERS).

Nine Induction Lines, consisting of a hardening furnace, polymer/water quenching, and a tempering furnace are not permitted. During a Permit engineer's permit review, it was determined that the polymer / water quenching lines are not sources of air pollution. The natural-gas fired burners associated with the furnaces qualify as exempt under Rule 282(2)(b)(i).

The facility uses several water-based alkaline metal part washing tanks and operate under PTI exemption Rule 282(1)(iii). The facility uses 3 alkaline-based cleaners.

**Emission Unit (EU) / Flexible Group (FG) Details**

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date / Modification Date	Flexible Group ID
------------------	--	--	-------------------

EU1CHARDENTEMPER	Continuous heat treat belt line consisting of a natural gas-fired hardening furnace with an oil quench tank controlled by four (4) flares, a post-washer, and a natural gas-fired tempering furnace.	April 1992 / February 8, 2017	FG-BELTLINES
EU2CHARDENTEMPER	Continuous heat treat belt line consisting of a natural gas-fired pre-washer, a natural gas-fired hardening furnace with an oil quench tank controlled by two (2) flares, a natural gas-fired post-washer, and a natural gas-fired tempering furnace.	May 2007 / February 8, 2017	FG-BELTLINES
EU4CHARDENTEMPER	Continuous heat treat belt line consisting of a natural gas-fired pre-washer, a natural gas-fired hardening furnace with an oil quench tank controlled by two (2) flares, a post-washer, and a natural gas-fired tempering furnace.	November 1997/ February 8, 2017	FG-BELTLINES
EU5KHARDENTEMPER	Continuous heat treat belt line consisting of a natural gas-fired pre-washer, a natural gas-fired pre-heat furnace, a natural gas-fired hardening furnace with an oil quench tank controlled by two (2) flares, a natural gas-fired post-washer, and a natural gas-fired tempering furnace.	April 2005 / May 8, 2008	FG-BELTLINES
EU1KTEMPER	Continuous natural gas-fired tempering furnace that is used off-line by the belt lines.	January 2000 / May 8, 2008	FG-BELTLINES
EU7AHARDEN	Natural gas-fired heat treat batch furnace with integral oil quench controlled by one (1) flare.	January 1977 / May 8, 2008	FG-BATCHPUSHER
EU8AHARDEN	Natural gas-fired heat treat batch furnace with integral oil quench controlled by one (1) flare.	January 1977 / May 8, 2008	FG-BATCHPUSHER
EU9AHARDEN	Natural gas-fired heat treat batch furnace with integral oil quench controlled by one (1) flare.	January 1997 / May 8, 2008	FG-BATCHPUSHER
EU1ATEMPER	Natural gas-fired batch tempering furnace.	January 1967 / May 8, 2008	FG-BATCHPUSHER
EU2ATEMPER	Natural gas-fired batch tempering furnace.	January 1967 / May 8, 2008	FG-BATCHPUSHER
EU4ATEMPER	Natural gas-fired batch tempering furnace.	January 1985 / May 8, 2008	FG-BATCHPUSHER
EU11ATEMPER	Natural gas-fired batch tempering furnace.	January 1996 / May 8, 2008	FG-BATCHPUSHER
EU1HHARDENTEMPER	Batch pre-washer, natural gas-fired pusher pre-heat furnace, natural gas-fired pusher hardener furnace with integral oil quench controlled by three (3) flares, batch post-washer, and a natural gas-fired pusher tempering furnace.	February 2002 / May 8, 2008	FG-BATCHPUSHER
EU2HHARDENTEMPER	Batch pre-washer, natural gas-fired pusher pre-heat furnace, natural gas-fired pusher hardener furnace with integral oil quench controlled by three (3) flares, batch post-washer, and a natural gas-fired pusher tempering furnace.	January 2005 / May 8, 2008	FG-BATCHPUSHER
EU9HTEMPER	Natural gas-fired batch tempering furnace.	January 1990 / May 8, 2008	FG-BATCHPUSHER
EU11HTEMPER	Natural gas-fired batch tempering furnace.	January 1990 / May 8, 2008	FG-BATCHPUSHER
EU12ATEMPER	Continuous natural gas-fired tempering furnace that is used off-line by the pusher lines.	January 2000 / May 8, 2008	FG-BATCHPUSHER
EU1SHARDEN	Natural gas-fired heat treat batch furnace with integral oil quench controlled by two (2) flares.	June 2015 / February 8, 2017	FG-BATCHPUSHER
EU2SHARDEN	Natural gas-fired heat treat batch furnace with integral oil quench controlled by two (2) flares.	TBD / NA	FG-BATCHPUSHER
EU1SATEMPER	Natural gas-fired batch tempering furnace.	June 2015/ February 8, 2017	FG-BATCHPUSHER
EU2SATEMPER	Natural gas-fired batch tempering furnace.	June 2015/ February 8, 2017	FG-BATCHPUSHER
EU3SATEMPER	Natural gas-fired batch tempering furnace.	June 2015/ February 8, 2017	FG-BATCHPUSHER

EU4SATEMPER	Natural gas-fired batch tempering furnace.	June 2015/ February 8, 2017	FG-BATCHPUSHER
Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.			

**FLEXIBLE GROUP SUMMARY TABLE**

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FG-BELTLINES	Continuous heat treating equipment consisting of belt furnace lines with oil quenching. All lines perform the same heat treating process and are used interchangeably. The lines generally include pre-washers, one pre-heat furnace, hardening furnaces with quench tanks, post-washers, and tempering furnaces.	EU1CHARDENTEMPER, EU2CHARDENTEMPER, EU4CHARDENTEMPER, EU5KHARDENTEMPER,  EU1KTEMPER
FG-BATCHPUSHER	The batch and pusher equipment has integral quenches and perform the same heat treating process. This flexible group consists of integral-quench batch hardener furnaces, integral-quench pusher hardener furnaces, batch temper furnaces, pusher temper furnaces, batch washers, and batch soluble oil dunk tanks.	EU7AHARDEN, EU8AHARDEN, EU9AHARDEN, EU1ATEMPER, EU2ATEMPER, EU4ATEMPER, EU11ATEMPER, EU1HHARDENTEMPER, EU2HHARDENTEMPER, EU9HTEMPER, EU11HTEMPER, EU12ATEMPER, EU1SAHARDEN, EU2SAHARDEN, EU1SATEMPER, EU2SATEMPER, EU3SATEMPER, EU4SATEMPER

**Facility Background**

IST provides hardening services for various automotive-related fasteners using heat treatment. Operations are conducted in 2 buildings, with main operations occurring at the East Building (where administrative offices are also located), and additional process operations occurring in the West Building. They currently employ a little less than persons and operate 24 hours a day and average about 6 days a week.

Heat treatment is conducted using two types of processes, including quenching in oil or a polymer / water solution, and tempering. Oil quenching based hardening involves heating the metal part to a high temperatures and quench it in oil or polymer / water solution. Oil quenching is done in a sealed chamber. Tempering based hardening involve reheating the metal part to medium temperatures and then air cooling it. The process equipment is equipped with flares to control VOC-generated emissions from the heating of oil coated parts and from the oil quenching process

The facility has various heat treat lines that employ various combinations of natural gas (NG)-fired hardening and tempering furnaces and components. IST employs continuous and "batch-type" equipment. Not all parts are tempe after quenching in oil. Typical combinations and order of components include the following:

- Belt (continuous, like a conveyer line and most efficient, FG-BELTLINES) Line: pre-wash tank, hardening furnace, oil quench tank, post-wash tank, and temper furnace. This process uses "beltline quenching," and include furnace and an oil quench tank and a conveyor belt that runs through both components.
- Pusher (semi-continuous, FG-BatchPusher) Line: pre-wash tank, hardening furnace, oil quench tank, post-wa tank, and temper furnace that is not directly connected to this line and the parts need to be loaded into it. The push furnace heats up multiple loads of metal parts and then is quenched one at a time at a specific cycle.
- Batch (used for fewer parts, separate hardening and tempering areas, FG-BatchPusher) Line: pre-wash tank, hardening furnace, oil quench tank, post-wash tank, and temper furnace that is not directly connected to this line a the parts need to be loaded into it. The batch furnace heats up an individual load of metal parts and then is quench one at a time at a specific cycle.

IST 2015 MAERS reported facility wide, 3.67 tons VOC emissions using a combination of 2007 stack test derived : MAERS emission factors (EFs). These emissions are below both of the Flexible Group emission limits, FG-BELTLINES, 15.6 VOC tons per year (tpy) emission limit, and FG-BATCHPUSHER, 3.8 VOC tpy emission limit. Emissions in 2016 were similar.

### Pre-Inspection Meeting

The pre-inspection began with a background summary of IST, which was provided by JM. The summary included various operational characteristics, product line descriptions, etc. as summarized above. JM also briefly summarized their permit history, as they were previously a major / ROP source until they conducted stack testing in 2007 to obtain site specific EFs to reevaluate their potential to emit and to support their reclassification to an Opt-Out Source. In 2008, an Opt-Out PTI was issued. On February 8, 2017, PTI 394-07A was issued in response to a Violation Notice that was a result of the June, 2016 inspection. The new permit removed or added various emission units to make the new permit current.

I asked if any process changes have occurred at the facility since the permit was issued in February of 2017. JM noted that the following emissions units are being permanently removed from service in the near future. These include EU7AHARDEN, EU8AHARDEN, EU9AHARDEN, EU1ATEMPER, EU2ATEMPER, EU4ATEMPER, and EU11ATEMPER. He noted that EU12ATEMPER and EU2SHARDEN were currently not installed. (Need to be installed within 18 months of February 8, 2017 to remain covered by PTI 394-07A.)

Next, we discussed the permitting status of 2 anhydrous ammonia storage tanks. They were previously thought of as being considered part of an atmospheric generator. However, the tanks aren't part of an atmospheric generator. Rather, they are used as the source of ammonia for a carbonitriding process. <https://en.wikipedia.org/wiki/Carbonitriding>

One ammonia tank is located just outside the West Building with a storage capacity of 1000 gallons with a fill capacity of 85%. It was installed in the 2006-2007 time frame. Another 2300 gallon tank is located adjacent to the East Building. It has a fill capacity of 50%. In 2017, IST used 24,000 pounds of ammonia.

Next, we reviewed their permit conditions and I requested records required by permit Special Conditions (SCs) FG BELTLINES VI.2 and FG-BATCHPUSHER VI.2 for 2017. He then pulled up the records on screen and printed a copy for me.

JM noted that the quench oil that was highlighted in the 2017 PTI was the same quench oil that was currently being used.

### Onsite Inspection Narrative

JM then provided a site tour and overview of the facility's operations. The tour began in the East Building and then proceeded to the West Building. Observations/findings recorded below:

EU ID	Observations / Comments
EU1CHARDENTEMPER	Not operating.
EU2CHARDENTEMPER	Observed operation. It was properly equipped with 2 operating flares. No smoke observed.
EU4CHARDENTEMPER	Observed operation. It was properly equipped with 2 operating flares. Note. The roof inspection showed white smoke estimated at 30% opacity was coming from this process. The smoke would last for about a minute then restart several minutes. It wasn't clear why.
EU5KHARDENTEMPER	Observed operation. It was properly equipped with 2 operating flares. No smoke observed.
EU1KTEMPER	Not observed.
EU7AHARDEN	Not in operation.
EU8AHARDEN	Not in operation.
EU9AHARDEN	Not in operation.
EU1ATEMPER	Not in operation.
EU2ATEMPER	Not in operation.
EU4ATEMPER	Not in operation.
EU11ATEMPER	Not in operation.
EU1HHARDENTEMPER	Observed operation. It was properly equipped with 3 operating flares. No smoke observed.
EU2HHARDENTEMPER	Not in operation but appeared to be about ready to operate as 3 flares were operating.
EU9HTEMPER	Not observed.
EU11FTEMPER	Not observed.
EU12ATEMPER	Not installed yet.
EU1SHARDEN	New but not operating.
EU2SHARDEN	Not currently installed.
EU1SATEMPER, EU2SATEMPER, EU3SATEMPER, EU4SATEMPER	Natural gas fired batch tempering furnaces not observed.

All process / EUs in operation had its flare(s) in operation. (Facility has 23 flares required by their PTI but have sev more generally for safety purposes. ) Very little smoke was observed inside either the East Building or West buildir We also viewed both ammonia storage tanks and the roof of both buildings. No odors noted near the ammonia tar They appeared to be well maintained. On the roof for the East building I observed one stack that was periodically emitting white smoke. It was SV4CTEMPCHRGEX. It also was equipped with a rain cap. PTI requires unobstructe vertically upwards. Of the 90 stacks listed in the permit, only 7 are allowed to have a rain cap. Many of the stacks the East building had rain caps but only 2 stacks on the West building had a rain cap or an obstruction. I noted sor light to moderate oily smell on the East building roof. No other observations. Note: The East building roof was eas accessed by a ladder. The West building roof was accessed by using a portable mechanical lift. See attached phc of ammonia tanks, the roof stacks, various flares, and process lines.

### **Post-Inspection Meeting**

We had a brief post-inspection meeting as I was leaving. I informed JM that my only concerns included the permi status of the ammonia tanks, the numerous stacks that had rain caps on them and the one stack that was sent emitting white smoke. I thanked JM for his excellent cooperation and assistance, and I departed the facility at approximately 11:00 am.

### **Recordkeeping Review**

Attachment (2) is a listing of the process emissions factors from stack testing that they use to compete MAERS emission reporting.

Attachment (3) is the latest Malfunction Abatement Plan (MAP) that IST is using. IST appearing to be following the MAP. They conduct daily/weekly inspections and use checklists.

Attachment (4) is an example weekly checklist filed out for 2/14/18. It includes a requirement to make sure the flare are lit.

Attachment (5) shows all the quench tanks locations at the facility.

Attachment (6) shows required records for 2017 for the amount of metal processed and calculated emissions. VOC emissions not including natural gas usage was 5457 pounds (2.72 tons) which is well under the limit of 15.6 tpy for FG-BELTLINES and 3.8 tons for FG-BATCHPUSHER. (Actual 776 pounds for FG-BATCHPUSHER. Metal usage 21,530 tons for FG-BELTLINES(Limit 157,061 tpy) and 7160 tons for FG-BATCHPUSHER. (Limit 50,447 tpy)

Attachment (7) is the PTI 394-07A review sheet which outlines how the previous VN was resolved.

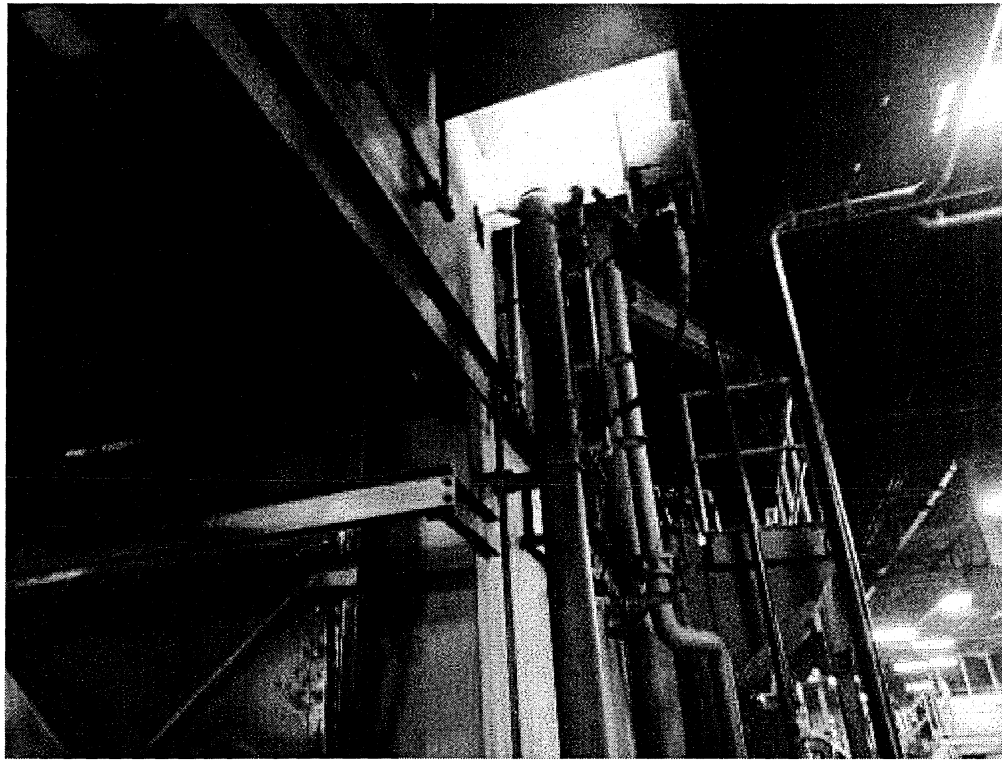
### **Compliance Summary**

Based upon the facility inspection, review of the records, and review of applicable requirements, the Company appears to be in compliance except for the following:

Rule 201-No Permit to Install. A 1000 gallon and a 2300 gallon ammonia storage tank each require a separate PTI permit. The 1000 gallon tank maybe eligible for a General Permit. The 2300 gallon tank likely is ineligible for a perr as it does not meet the required setup distances.

PTI 394-07A- FG-BELTLINES & FG-BATCHPUSHER VIII. STACK/VENT RESTRICTIONS. A number of stacks d not discharge unobstructed vertically upwards.

A Violation Notice (VN) will be sent to the Company and they will have 21 days to respond.



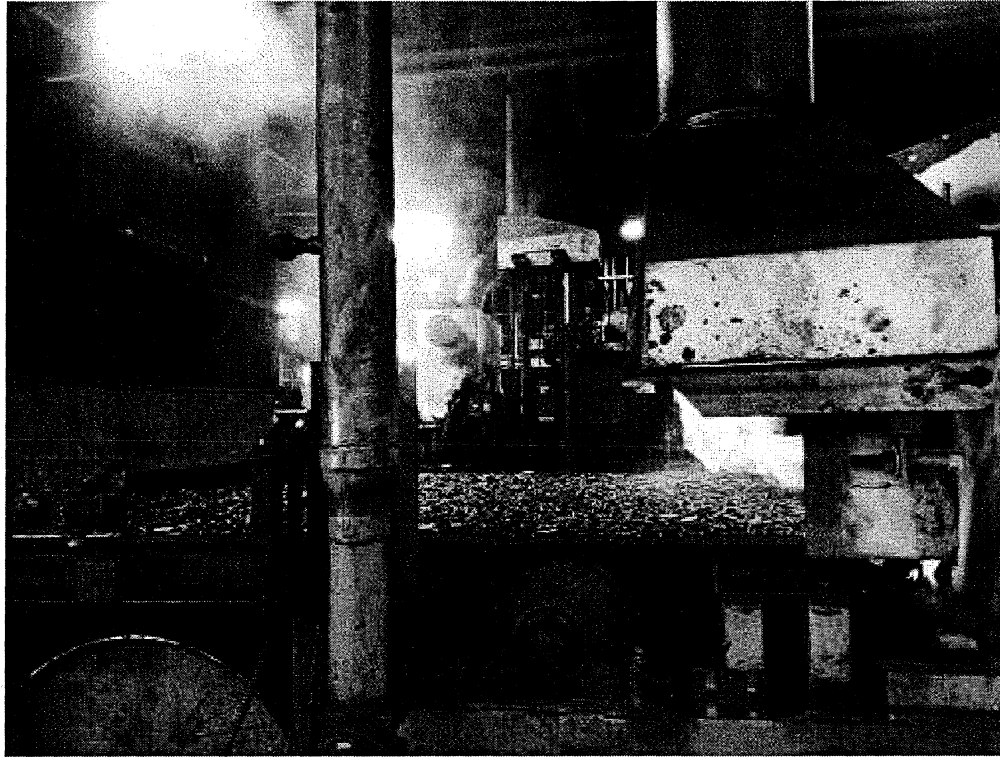
**Image 1(Flare) : Flare**

KODAK  
BX 50 150

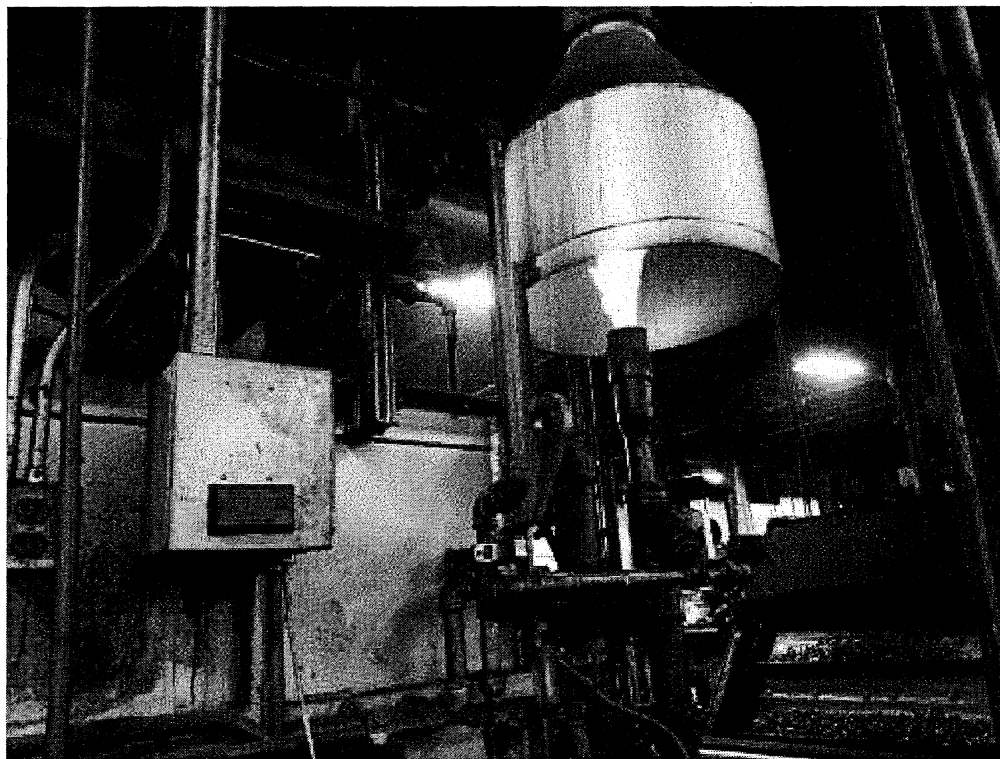
Daily Checklist Atmosphere Dept. Heat Treater ISA 10		3rd Shift					1st Shift					2nd Shift										
Week of: 2-26-18		M	T	W	TH	F	S	S	M	T	W	TH	F	S	S	M	T	W	TH	F	S	S
1	Leading and Park back areas free of foreign material	Y	Y	Y					Y	Y	Y					Y	Y	Y				
2	Leading and Park back areas are within 750' of flare	Y	Y	Y					Y	Y	Y					Y	Y	Y				
3	Between and out of 15' - 10' S.C.H.	Y	Y	Y					Y	Y	Y					Y	Y	Y				
4	All flare burners are correctly set in main furnace and tempering furnaces (per settings on plates)	Y	Y	Y					Y	Y	Y					Y	Y	Y				
5	Flare burners are performing job functions per route card instructions (ie. leading, back lead)	Y	Y	Y					Y	Y	Y					Y	Y	Y				
6	Flare guard reflector jacket is in and sufficient in burn log off	Y	Y	Y					Y	Y	Y					Y	Y	Y				
7	Flare guard pipe sufficient offset is correct	Y	Y	Y					Y	Y	Y					Y	Y	Y				
8	Flare burners are in "Normal" for furnace and westburn	Y	Y	Y					Y	Y	Y					Y	Y	Y				
9	Received checklist with blistering operator and performed a walk through of the furnace area. Both operators sign off. Note any issues or items on page 2.	Y	Y	Y					Y	Y	Y					Y	Y	Y				
Supervisor reviews log each day sometime after the first hour of the shift		Y	Y	Y					Y	Y	Y					Y	Y	Y				
Flare burners		Y	Y	Y					Y	Y	Y					Y	Y	Y				
Flare guard		Y	Y	Y					Y	Y	Y					Y	Y	Y				
Flare pipe		Y	Y	Y					Y	Y	Y					Y	Y	Y				

Flare burners that is up and running production. Note any

**Image 2(Flare check sheet) : Example of a daily flare check sheet.**



**Image 3(Flare)** : Flare. To the left of the flare is steam from a washing process.



**Image 4(Flare)** : Flare



**Image 5(Roof-East)** : Part of roof of the East Building.

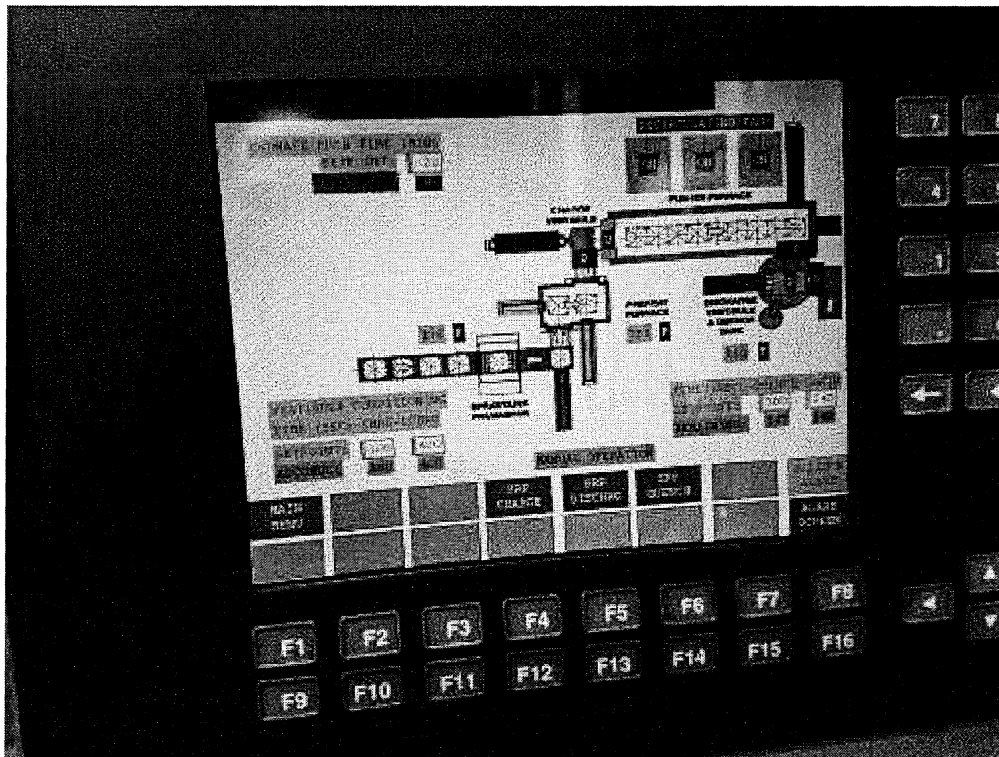


**Image 6(Smoke)** : Smoke coming from stack with rain cap.

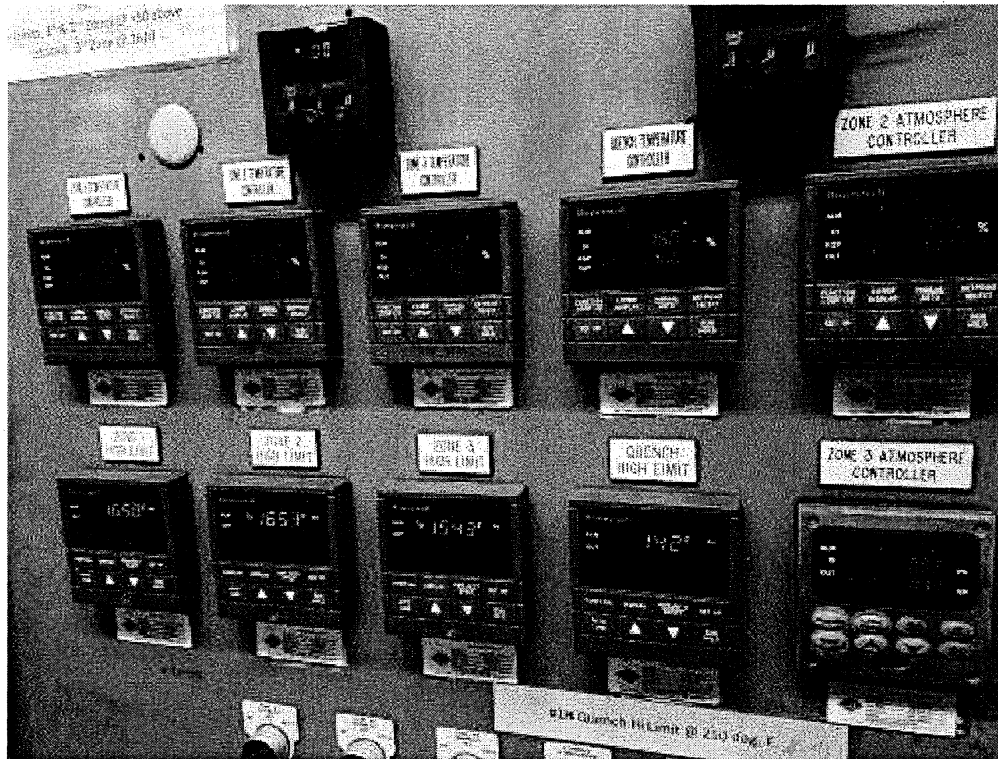




**Image 7(Ammonia)** : 1000 gallon Ammonia storage tank adjacent to West building.



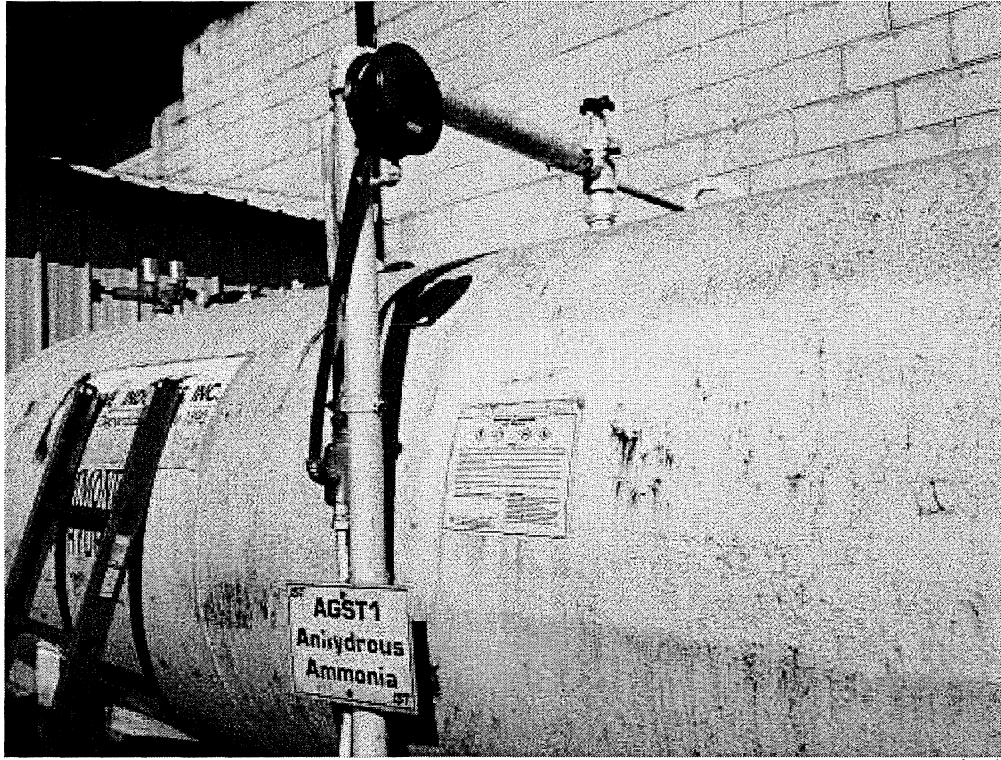
**Image 8(Process Flow) :** Process flow diagram



**Image 9(Temp controls) :** Temp control panels of one of the furnaces.



**Image 10(Roof-West) :** Roof of West building.



**Image 11(Ammonia tank) :** 2300 gallon ammonia tank adjacent to East building.

NAME M. Kovalchuk

DATE 3/2/2018

SUPERVISOR [Signature]