

**Mansfield Municipal Electric Department Light Commissioner's Meeting**  
**November 6, 2013**

**Present:** George Dentino; Chairman, Olivier Kozlowski; Vice Chairman, Jess Aptowitz; Clerk, Douglas Annino, Kevin Moran, William Ross; Town Manager and Gary Babin; Director

**Transformer T4 Repair** - Chairman Dentino opened the meeting and explained that this was a last minute meeting due to emergency circumstances the staff had brought to the Board.

Gary Babin, Director of the MMED, is present to request authorization from the Board for an emergency procurement. Mr. Babin informed the Board that during routine testing, performed annually, of the Transformer T4 at the Gilbert Street Substation, a power factor problem was detected. An oil sample was taken and sent to Doble Engineering, one of the leaders of the industry for transformer testing, and found that there was an abnormally high power factor test (4.58%) where 5% is the threshold. Mr. Babin noted this put the transformer at a marginal area to have to perform repair work but what was more concerning was that the tests have been exponentially increasing over time.

Mr. Babin noted the test results were sent to Waukesha Transformer, manufacturer of large substation transformers, for evaluation and it was noted that the dielectric strength of the oil, which insulates from any kind of flashover, had dropped significantly and there was a presence of visual particles that caused degradation of the insulating capacity of the oil. Mr. Babin reported that Waukesha's recommendation was provided to Doble Engineering, which suggested that to remedy the issue a hot oil process could be used to remove the volatile contaminants in the oil. Waukesha also recommended that MMED could perform the hot oil treatment or that MMED could continue to monitor the problem, although they noted the problem could lead to thermal breakdown of insulation making the transformer more susceptible to failure. Based on all the information obtained by the testing company used, UPG, they recommended MMED not energize the transformer and MMED had not done so. Mr. Babin explained that because fall and spring is when testing is done, due to it being a light load period, the concern here is that it is getting into a heavy load period of extreme weather, where December 1<sup>st</sup> is the guideline, and MMED needs to have everything in service.

Mr. Babin informed the Commission that the transformer was manufactured in 2000 (13 years old) and cost approximately \$940,000. The life expectancy of a substation transformer of this nature is about forty years. It is Mr. Babin and Mr. Ross's recommendation to address problem immediately because the condition of the oil will not improve and continue to degrade and if MMED were to continue monitoring the problem they felt it would provide an unacceptable risk because it would make the transformer more susceptible to failure. Mr. Babin stated that one issue that affects this is that MMED has not yet completed the Bird Road Substation interconnection to the Gilbert Street Substation.

Mr. Babin reported that MMED solicited proposal from Waukesha to perform the hot oil testing and they came back with a price of \$86,500 so given the magnitude of the price and work, MMED decided to solicit other bids from transformer companies: Delta Star, manufacturer of the transformer, and from ABB, the largest equipment manufacturer in world. Delta Star's quote came back slightly under \$78,000 and ABB was \$138,000 but MMED felt that the Delta Star price indicated that Waukesha's quote was consistent with the market.



Because of the cost, MMED sought advice from Town Counsel, Rod Hoffman. Mr. Hoffman noted the jurisdictional authority to declare an emergency procurement was unclear so he consulted with the Department of Capital Asset Management and Maintenance (DCAMM), a State agency. Mr. Hoffman, based on his analysis, stated that under Chapter 164 the Light Commission has authority to declare an emergency for the purposes of getting work done. Mr. Babin explained the Mr. Hoffman's opinion is based on the timeframe of getting the work completed by December 1<sup>st</sup> and getting into a slot with the Delta Star's scheduling in order to fix the problem. Mr. Babin felt that MMED had exhibited due diligence on the procurement issue and that of the three quotes provided, Delta Star appeared to be most qualified given cost, the fact that they manufactured the transformer and also that they have 5 rigs travelling the country performing this type of work.

Mr. Babin asked the Commission to declare an emergency procurement and allow MMED to waive the standard advertising and bidding requirements because 1) the opinion by Town Counsel stated that this situation qualified; 2) MMED performed due diligence in the solicitation of 3 bids; 3) immediate repair will avoid going into the winter with a suspect transformer; and 4) the situation is not going to improve and the process of assuring the integrity of the transformer will still need to be completed. According to Mr. Babin the four to five day process could be started by Delta Star at the end of next week.

Mr. Ross explained that he had been involved primarily in the emergency procurement side of this and noted his thought is to handle the problem immediately or the Town runs the potential risk of a transformer failure during the winter. He felt that the routine testing puts the Town in a position to address any issues before a high load season, which is what you want. Mr. Ross explained that if the Commission wanted to move forward, which is his recommendation, they will need to authorize the Town Manager, as Manager of MMED, to go forward with emergency procurement. Mr. Ross noted that MMED will also need to report back the results of the meeting to DCAMM with the minutes of meeting. He also noted for clarity roll call votes are recommended.

Mr. Kozlowski asked if it were two separate motions, first to declare an emergency and then to authorize the Town Manager, as Manager of MMED, to move forward, to which Mr. Ross noted yes it was two items. Mr. Ross noted that the emergency is really based on danger to public health, safety and welfare in that if the power goes out during cold weather customers will be without heat.

Mr. Annino asked if Mr. Babin knew why the oil was breaking down to which Mr. Babin explained that internally the transformer contaminants concentrate around the coil and compromise the power factor making the transformer susceptible to short circuiting. Mr. Babin noted that the hot oil process, where the oil is heated to 90 degrees centigrade, breaks down the matter around the coil and then the oil is drained, flushed, and filled with new oil at 40 degrees centigrade and circulated throughout the transformer. Mr. Annino asked where the buildup comes from to which Mr. Babin could not say but that it is not a typical problem. Mr. Annino is concerned that this may be an inherent defect with the transformer. Mr. Babin noted this is the industry recommended standard procedure but that there are no guarantees and that MMED is taking an aggressive set of steps to remedy the problem. Mr. Annino asked about warranties but Mr. Babin noted the transformer is a 13 year old piece of equipment and this is the first time MMED has dealt with a problem of this nature. Mr. Annino wanted to be sure that the entire scope of work is included in the price and that there are very few extras. Mr. Annino asked if prepayments could be made to which Mr. Ross noted that it is against State law. Mr. Annino was



assured by Mr. Babin that Delta Star would be disposing of the oil properly and that MMED will be on site constantly. Mr. Annino asked what happens when a transformer fails to which Mr. Babin explained there is a short circuit inside the core which renders it useless. He noted a transformer can be taken out of service and sent back to the manufacturer where they can rewind the core. The copper windings are the items that fail.

Mr. Moran wanted to confirm that there are no other real players if the Commission chooses to declare an emergency. Mr. Babin noted there would be testing companies that really don't do this regularly and this is not their main expertise so MMED went directly to manufacturers, of which there are very few. If MMED were to solicit bids from testing companies it would require the need to really evaluate if those companies are qualified. Mr. Moran asked if the Commission chooses to do this and there is no improvement what would be the next step. Mr. Babin reported that MMED would keep the transformer in service and continue to test until that time where it could be sent back to manufacturer and fixed on a temporary basis or replaced. Mr. Moran stated that if MMED lets the situation stand there is a potential risk of failure.

Mr. Kozlowski reaffirmed from Mr. Babin that warranties do not exist. Mr. Kozlowski inquired if something of this nature happens a lot and does Mr. Babin know if this is a defect within the unit to which Mr. Babin stated he does not get the sense that this is a very common problem in the industry. Mr. Kozlowski asked if it was a defective unit or did we not maintain it well or just bad luck to which Mr. Babin stated he would do further investigative work.

Chairman Dentino noted to Mr. Annino that the warranty was extremely limited on this unit and regarding change orders there are clauses regarding force majeure and is typically a very one sided agreement. The Chairman wanted to clarify that the initial yearly test was completed at 25 degree centigrade. Mr. Babin stated that was correct and that Waukesha wanted the test re-run at 100 degrees centigrade so a second sample was taken at that temperature where the 4.58% power factor was the result. Chairman Dentino asked what the initial result at 25 degrees was. Mr. Babin distributed test reports to the Commission. Mr. Babin explained that the report shows the results done at 25 degrees and 100 degrees, which yielded the 4.58% and showed presence of contaminants in the oil. Mr. Babin also noted that in looking at the results you can see that the power factor is increasing exponentially over time. Chairman Dentino stated that the results were low at the 25 degree centigrade test and that Waukesha wanted the test done at 100 degrees because you get more accurate results to which Mr. Babin agreed.

Chairman Dentino noted that in reality what we are doing is not rebuilding the transformer but a service or replacement of the oil which is preventative maintenance. The Chairman noted that the oil in and of itself has been in the unit since 2000 and that it was confirmed that something is in it (grit, epoxy or paint) but what happened is that when the test went from 25 degrees to 100 degrees it improved the power factor by about 50%. The Chairman noted the transformer was showing better results after the 100 degree temperature test and stated that Waukesha gave the alternative recommendation of monitoring the unit. The Chairman felt that whatever the contaminant is, it is being flushed out and that the existing oil in its own state is good other than the contaminant. Mr. Babin could not see where the contaminant would go since it is a closed container to which Chairman Dentino thought maybe it is due to heat.



Chairman Dentino inquired if SCADA had anything to add on this and also noted the gas test results on this were good. Chairman Dentino noted the current 4.58% is an acceptable number to which Mr. Babin stated it is on the threshold of the IEEE acceptable limit. The Chairman noted it is 0.42% away and Mr. Babin stated he did not feel we should take that chance. The Chairman noted that UPG is involved and alternatively UPG may choose to leave the unit alone and monitor it on a more frequent basis and that the unit is not in serious distress at this time. Mr. Babin noted that even though there are no signs of distress what happens if it is put back into service and in the winter months it shows signs of distress what would we do. Chairman Dentino noted all previous tests showed the oil is relatively stable. Mr. Babin stated there is a baseline and through time is now showing an exponential increase in power factor.

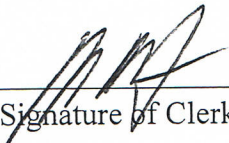
Mr. Aptowitz asked if the Light Commission should spend the \$80,000 or roll the dice. Chairman Dentino did not find it rolling the dice as he expects more from a 14 year transformer and felt that the threshold of 5% has a safety standard built in and it is not an exponential number.

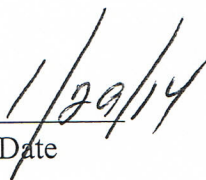
The discussion initiated by Mr. Aptowitz was if the Light Commission should be involved in making a decision of this nature, which involved maintenance of equipment, and shouldn't that be a decision for the manager. He understood making the declaration of an emergency given that this would result in bypassing the normal procurement process but felt the decision should be left to management on the course of action.

**Motion:** To declare the situation as presented by the Mansfield Municipal Electric Department as an emergency (Kozlowski/Annino) Kozlowski (AYE), Moran (AYE), Annino (AYE) Aptowitz (NAY) Dentino (NAY) **PASSES 3:2**

**Motion:** To authorize the electric department Manager to proceed with the repairs based on the proposal by Delta Star, Inc. (Kozlowski/Annino) Kozlowski (AYE), Moran (AYE), Aptowitz (NAY), Annino (AYE), Dentino (NAY) **PASSES 3:2**

**Motion:** To Adjourn Light Commissioner Meeting (Annino/Aptowitz) at 9:37pm **PASSES 5:0**

  
Signature of Clerk

  
Date

Tracey Whalen