

**AGENDA ITEM EXECUTIVE SUMMARY**Agenda Item number: **4a**

Title:

Recommendation to Approve an Ordinance Authorizing the Sale of Item of Personal Property Owned by the City of St. Charles

Presenter:

Chris Minick

Meeting: Government Operations Committee

Date: September 6, 2016

Proposed Cost: \$

Budgeted Amount: \$

Not Budgeted: **Executive Summary** *(if not budgeted please explain):*

We are asking for approval to sell the said obsolete item to the highest respective bidder:
Decommissioned Substation #6 34.4 KV Transformer.

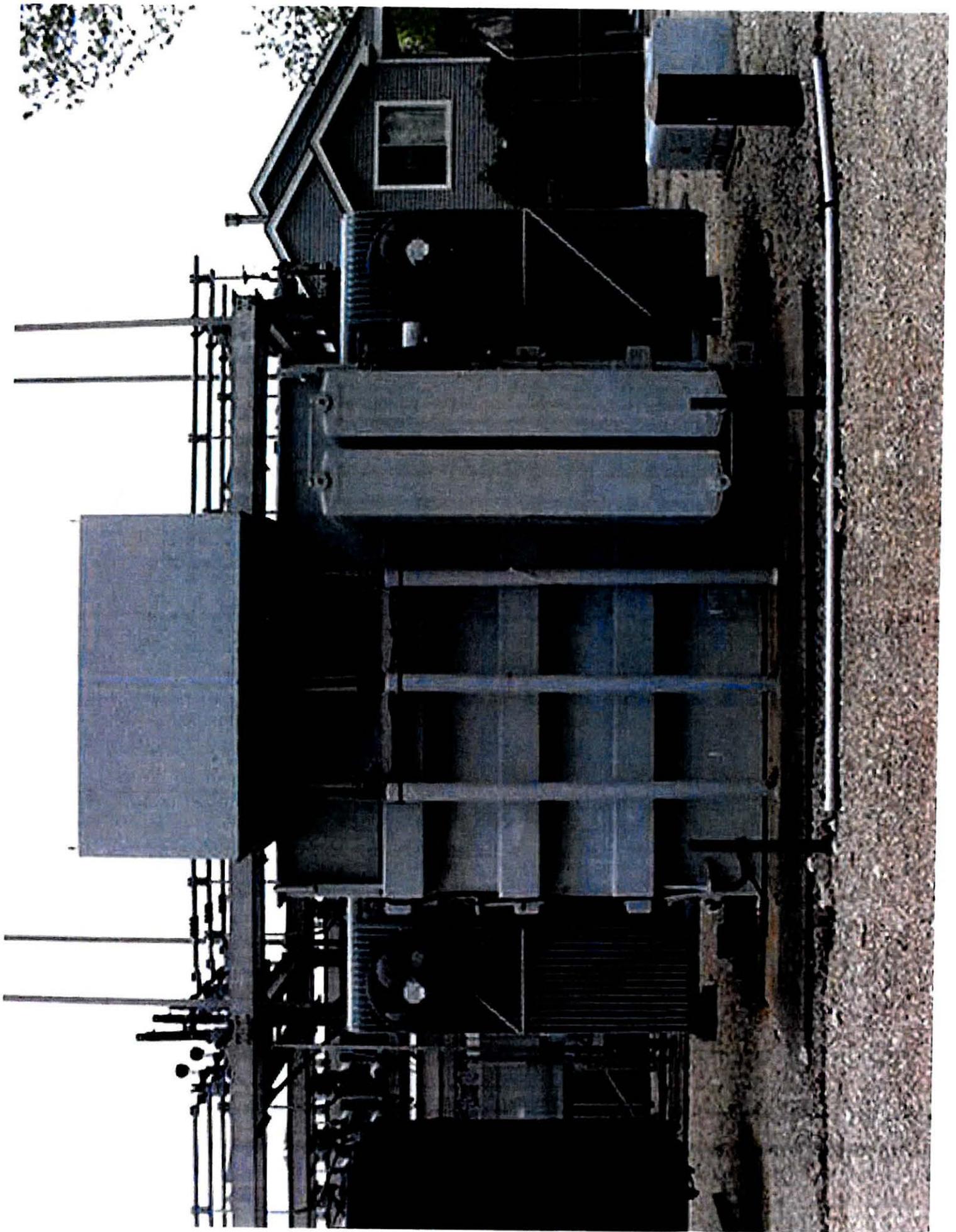
This unit, manufactured in 1979, is scheduled for replacement and no longer viable for City use.

Attachments *(please list):*

Conditions Assessment Summary Sheet
Ordinance

Recommendation/Suggested Action *(briefly explain):*

Recommendation to approve an Ordinance Authorizing the Sale of Item of Personal Property Owned by the City of St. Charles.



S/N:	A5969	ID#:	6T1
MFG.:	Asea	Location:	SUB 6
MFG. Date:	1979	kV:	34.4 - 12.47/7.2
		MVA:	10/12.5/15//16.8

Overall Health Summary:

Based on the oil and electrical test data the transformer is downgraded from a rank of 3 to a rank of 1 out of 5, with 1 being the worst and 5 the best. The ranking for the oil data was downgraded from a Code 3 to a Code 2 due to the high moisture content and subsequent low oil dielectric breakdown. The electrical test data of this transformer is assigned a code 3 out of 5 since the measured watts loss of the bushing hot collar tests for the X0, X1, X2 and X3 bushings are all above the recommended limit and should be investigated. It is recommended to clean and retest the bushings to verify the results. It is recommended to update the electrical test data in one year to enable a better assessment of the transformer's present condition.

Update 1:

The overall transformer code is downgraded to a Code 1 due to the reported lack of oil in the H1 bushing. The note from testing on 11/8/2014 states that the "H1 bushing appears to be empty, Center H2 bushing is about 1/2 full, & the south H3 bushing is about 1/2 full". This condition should be confirmed as soon as possible since this indicates a possible leaking bushing. Bushings can leak into the transformer, making it difficult to confirm a leaking bushing by looking for oil on the external surfaces of the bushing and transformer. If the oil level cannot be detected because it is too low to verify through the sight glass, it should be replaced as soon as possible since a low dielectric fluid in the bushing can result in a dielectric failure that can cause damage to the transformer or other equipment in the area.

If the H1 bushing lack of oil problem is resolved then the overall transformer code would be expected to be upgraded from a Code 1 to a Code 2 due to the verified high moisture content in the transformer. If then the problem of high moisture in the transformer is resolved the overall transformer code would be expected to be upgraded from a Code 2 to a Code 3 due to the LV bushing high watt loss problems.

Oil Test Data Summary Review:

Based on the oil data provided this transformer was assigned a code 3 due to the elevated moisture content. This should be verified with a sample taken in a ground glass syringe after flushing a gallon of oil through the valve. If possible the transformer should be sampled when the transformer has been operating at a temperature greater than 55 °C for several days to get an estimate of the moisture in the paper.

Update 1:

Based on data from 2014 the oil test data summary is assigned a code 2 as the high moisture is verified and the relative saturation of the oil is in excess of 20 % which indicates the insulation is wet. The dielectric breakdown strength of the oil was unacceptable and this is likely caused by the high moisture content.

Data from 2013 and 2014 was submitted for the LTC and the both sets of data were consistent with previous reports and no problems were indicated. The LTC code remains unchanged at 5.

1. Operational Health

DGA

The dissolved gas data indicates that the transformer is operating normally. The total combustible gas (TCG) content is stable over time. The main contributor is the carbon monoxide from minor overheating of the cellulosic insulation. All of the hydrocarbon gases are low so overheating of oil or arcing are not a concern.

Moisture

The moisture in oil is elevated on all of the recent samples with an average relative saturation of over 30%. Free water was noted in many of the recent samples. Care should be taken to flush enough oil when sampling to ensure the sample tested is representative of the bulk oil. An estimate of the moisture in paper cannot be made as the top oil temperature at time of sampling is not high enough. If the transformer runs above 55 °C for three consecutive days a reasonable estimate of the moisture content in paper can be made. From the available test data, it appears that the insulation is wet.

2. Paper Condition

Furans and carbon oxides

The carbon oxides are low and stable over time and suggest that overheating of the cellulosic insulation is not occurring. The furanic compounds are all low and stable. The most recent data is from 2010; this test should be run every three years.

3. Oil Quality

The oil is in excellent condition and is not aged. The dielectric breakdown is acceptable for in-service oil. The test method is not listed but if it is run by ASTM D877 this is not recommended for main tank oil as it is not sensitive enough to dissolved metals and particles.

4. LTC

DGA

Based on the dissolved gas in oil data, this ASEA/RTE 1979 type UZDRT load tap changer (s/n: B7905-03) is assigned a code 5.

Oil

The moisture and oil quality is acceptable for in-service LTC oil. It is clear from the data that the oil was replaced in 2007. Prior to this change, the moisture was high and the oil quality was poor. Since 2007 the moisture has remained low and the oil quality is very good.

Electrical Test Data Summary Review:

The electrical test summary rating of this transformer is assigned a code 3 out of 5 since the measured watts loss of the bushing hot collar tests for the X0, X1, X2 and X3 bushings are all above the recommended limit and should be investigated. It is recommended to clean and retest the bushings to verify the results. It is recommended to update the electrical test data in one year to enable a better assessment of the transformer's present condition. Exciting current, SFRA, Leakage Reactance, and surge arrester tests should be included and should be performed on a routine basis to enable a more thorough assessment of the transformer's condition.

Overall Power Factor

The overall power factor test values are within the recommended limits.

Overall Capacitance

There were no benchmark values of capacitance provided for comparison purposes, therefore the standard analysis of capacitance test data is not possible. The most recent test results can be compared to factory test values or the earliest available field test values. The tested capacitance values can be used as a benchmark if no earlier test data is available.

Update 1:

Based on the test data from 11/8/2014, the overall capacitance values are within the recommended limits when compared to the 12/2/2010 results. However, this is a very limited comparison since the transformer was manufactured in 1979. A better analysis is to compare the capacitance values to the transformer factory test values or to the initial installation test values to determine if there have been any changes over the lifetime of the transformer.

Bushing Power Factor and Capacitance

The H1, H2 and H3 bushing C1 power factor and capacitance test values are within the recommended limits. The C2 power factor values are within the recommended limits, although there are no nameplate values for comparison purposes. There are no C2 capacitance nameplate values for comparison purposes so the standard analysis of the C2 capacitance is not possible.

Bushing Hot Collar

The grounded specimen test watts loss of the bushing hot collar tests for the X0, X1, X2 and X3 bushings are all above the Doble recommended limit of 0.1 watts. It is recommended to clean and retest the bushings to verify the results. The UST watts loss results are within recommended limits but the measured current indicates that the X0 bushing may have low liquid or compound level which should be verified. All of these tests should be repeated to challenge or confirm results.

Exciting Current and Loss

No data provided. It is recommended to conduct the exciting current test on a routine basis to assess the condition of the transformer.

Update 1:

The exciting current test results from 11/8/2014 follow the common high-low-high phase pattern and follow a recognized LTC tap range pattern.

Turns Ratio

No data provided. It is recommended to perform the turns ratio test on a routine basis to allow a more complete assessment of the transformer condition.

Leakage Reactance and Loss

No data provided. It is recommended to conduct the leakage reactance and loss test to establish a baseline that can be used to assess the condition of a transformer following a system event, after moving to a new location or any time the mechanical integrity of the transformer is in question.

SFRA

No data provided. It is recommended to conduct the SFRA test to establish a baseline that can be used to assess the condition of a transformer following a system event, after moving to a new location or any time the mechanical integrity of the transformer is in question.

Surge Arrester

No data provided. It is recommended to perform arrester insulation testing on a routine basis to allow a more complete assessment of the transformer condition.

Winding Resistance

No data provided.

Core Insulation Resistance

No data provided.

Winding Insulation Resistance

No data provided.

City of St. Charles, Illinois
Ordinance No. _____

**An Ordinance Authorizing the Sale of Items of Personal
Property Owned by the City of St. Charles**

WHEREAS, in the opinion of at least three-fourths of the Corporate authorities of the City of St. Charles, it is no longer necessary or useful to or for the best interest of the City of St. Charles to retain the personal property now owned by the City of St. Charles and hereinafter;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of St. Charles, Kane and DuPage Counties, Illinois as follows:

1. Pursuant to Illinois Compiled Statutes, 65ILCS 5/11-76-4, the City Council finds that the following personal property now owned by the City of St. Charles is no longer necessary or useful to the City of St. Charles and the best interests of the City of St. Charles will be served by its sale:

Transformer

2. Pursuant to said Section 65ILCS 5/11-76-4, the Purchasing and Inventory Control Division Manager be, and he is hereby authorized and directed to sell the foregoing described personal property now owned by the City of St. Charles to: the highest respective bidder.

Presented to the City Council of the City of St. Charles, Illinois, this _____ day of September, 2016.

Passed by the City Council of the City of St. Charles, Illinois, this _____ day of September, 2016.

Approved by the Mayor of the City of St. Charles, Illinois, this _____ day of September, 2016.

Raymond P. Rogina, Mayor

Attest:

Nancy Garrison, City Clerk

Council Vote:

Ayes: _____

Nays: _____

Absent: _____

Abstain: _____