Gas Management Case Study

Direct Labor Savings With Gas Management

SF_6 Academy

Gas Management Knowledge Center

www.wika.com/sf6

Basis for Case Study

- **Gas Management adds value.**

- One of the best ways to see that is to begin looking at the complete cost picture for gas monitoring. There are many hidden costs that are not considered with traditional monitoring. This case study provides a basis for uncovering the direct labor factor alone, which is only one of many “hidden” costs in traditional gas monitoring.

- Gas Management can also be done using these traditional means, however, the labor factor will increase as more time must be spent gathering data, analyzing data, and reporting trends. This type of process has already begun in Europe and may grow to cover additional countries in the future as SF_6 gas becomes more regulated.

Case Study Assumptions: Infrastructure

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Pressure and Temperature Measurement

For the case study, figures are used that could represent any large utility worldwide. Costs are in USD terms, but can easily be substituted on the Case Study spreadsheet at the Gas Management Knowledge Center on our website.

Assumptions for this Case Study

- **Typical Utility**
- **Approx. 1000 high-voltage substations**
- **Avg. of 16 SF_6 circuit breakers per substation**

- **25-year time horizon**
- **Maintenance crew of 1 person**
- **Labor costs $36/hr.** [1)] **(incl. 30% overhead)**
- **Inflation factored in via labor costs**

1) US Bureau of Labor Statistics, 2006 hourly pay figure for Electrical and Electronics Repairers, Powerhouse, Substation, and Relay

Case Study Worksheet

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The following information is needed to calculate the direct labor costs of reactive monitoring:

Costs for Reactive Monitoring – Typical Utility

Service life (in years)

How many substations do you operate?

How many gas tanks / monitors do you control in one substation (rough figure)?

How often do you take readings from the monitors?

How many individuals travel as a team to take readings?

How many minutes are needed to get to/from the substation (roundtrip)?

How much time is spent in the substation preparing the job?

How many minutes are spent reading each gas density monitor?

How much time is needed to prepare the follow-up paperwork per substation (documentation)?

Total Lifecycle Times

Driving time

Organization

Manual Readings

Documentation

Total direct labor cost for reactive monitoring

Total direct labor cost for reactive monitoring / substation

Total direct labor cost for reactive monitoring / tank

Case Study Worksheet

Pressure and Temperature Measurement

Costs for Reactive Monitoring – Typical Utility

Servicelife (in years): 25 years

How many substations do you operate? 1050 substations

How many gas tanks / monitors do you control in one substation (rough figure)? 15 tanks

How often do you take readings from the monitors? Once per month

How many individuals travel as a team to take readings? One

What does a team member cost per hour? $35.88 USD

Assumptions

- *US Bureau of Labor Statistics, 2006 hourly pay figure for Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (US Bureau of Labor Statistics, 2007)*
- *Assume benefits account for 30% of direct pay*
- *Assume that wages increase proportionally to inflation, so discounted analysis not necessary*

How many minutes are needed to get to/from the substation (roundtrip)? 120 minutes

How much time is spent in the substation preparing the job? 30 minutes

How many minutes are spent reading each gas density monitor? 2 minutes

How much time is needed to prepare the follow-up paperwork per substation (documentation)? 60 minutes

Summary of Total Lifecycle Times

Driving time: 120 minutes

Organization: 30 minutes

Manual Readings: 30 minutes per substation

Documentation: 60 minutes

Case Study Results

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Costs for Reactive Monitoring – Typical Utility

Using the figures on the previous slide, it is a matter of math to come up with the direct labor costs that this utility will have over the lifetime of it's switchgear just for manually monitoring SF_6 levels:

Total direct labor cost for reactive monitoring (grid):	**$34,094,970 USD**
Total direct labor cost for reactive monitoring / substation:	**$32,471 USD**
Total direct labor cost for reactive monitoring / tank:	**$2,029 USD**

This figure is only a starting point for determining the value Gas Management can add. It shows that the opportunity cost analysis is likely more important than a direct cost comparison, particularly since Gas Management is a part of the much larger Smart Grid.

Other “hidden costs” of reactive monitoring

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There are also other costs involved with manual monitoring. These also need to be considered to get a full picture of the value-added Gas Management brings to the table:

- **Transportation costs to / from substations**
- **Unplanned power failures**
- **Maintenance outages at inopportune times**
- **Training for new employees due to forecast retirements**
- **Cost of replacing SF_6 gas**
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Analyzing all of these factors together in a business case would give a much more thorough picture of the overall value Gas Management adds.

Conclusion: Gas Management Adds Value

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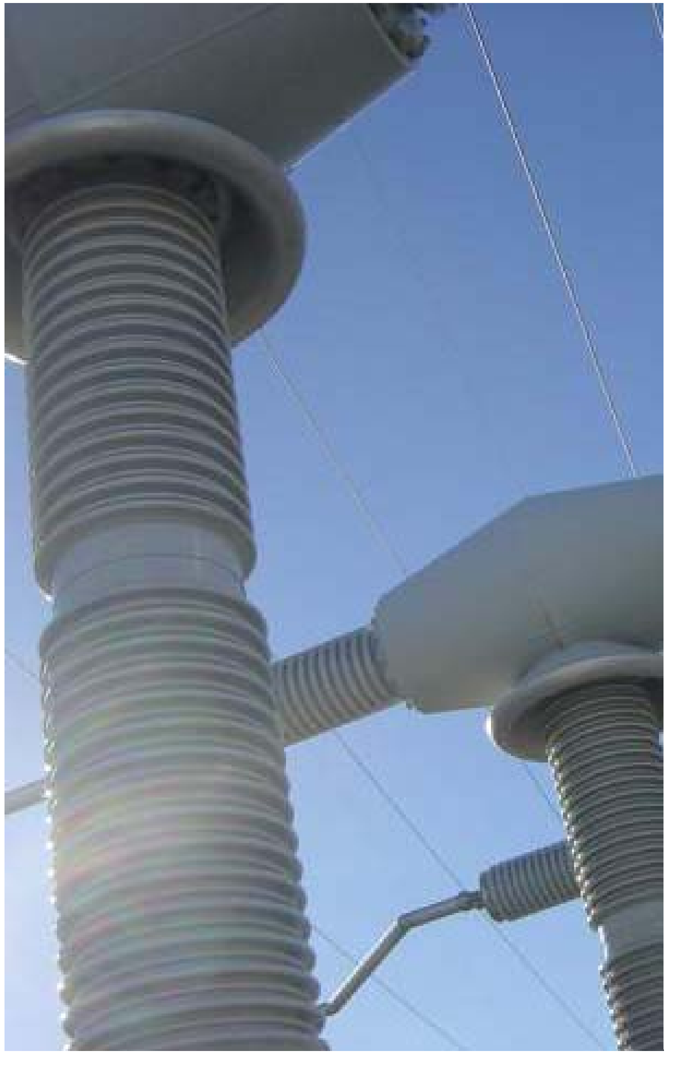
There are many reasons Gas Management is increasing in importance:

- Increased regulatory scrutiny
- Synergies with the Smart Grid
- Large opportunity cost of manual density monitoring and emission detection



This case study provides a starting point for further analysis on the true value that is possible as a result of Gas Management Systems. Investment today in a state-of-the-art Gas Management system will provide a large long-term dividend to the T&D industry in the future.

Please contact WIKA directly if you would like further information on Gas Management.