H-E-A-R SAY

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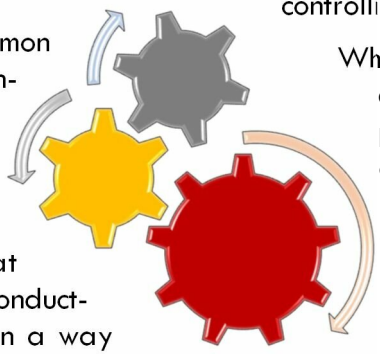
Learning From Incidents: Protips Part 5 Procedure Discipline

Over the almost 20 years that vPSI has been in business, the company's consultants have reviewed tens of thousands of incident investigations and have participated in many more. This perhaps unique experience provides a perspective that would be difficult, if not impossible, to replicate in any single organization. This article is the fifth in a series that will attempt to distil the accumulated knowledge of vPSI's consultants into "protips" that will be of value to those involved in investigating and learning from incidents.

Common procedure problems:

- Doesn't match reality
- Too much detail
- Not enough detail
- Too technically complex
- Inappropriate level of literacy required
- Language barrier
- Poor version control
- Incomplete revision rollout e.g. retraining not done



One of the common causes of unplanned events is a lack of procedure discipline, meaning that work is being conducted in real life in a way that deviates from the way it is defined in the relevant procedure. In modern safety parlance this is called "work-as-imagined versus work-as-done". In addition to problems with the procedures themselves, employees may decide not to strictly adhere to a procedure in its entirety, or even not refer to or use it at all. This may be a one-off instance or "just how we do it around here".

Absent a slip or lapse, people do what makes sense to them at the time. In most cases, if an action does not make sense to workers, they won't do it, a principle known as "local rationality". Thus, if a procedure is not followed, we can say that it was not seen as helpful or relevant to getting their work done. In other words, the procedure failed to fulfil its purpose of controlling the work.

When something goes wrong, and an investigation takes place, the philosophical objective is to develop and implement corrective actions that will reduce the unplanned event's future probability. While locally applied and / or temporary corrective actions are sometimes appropriate, an organization operating under a continual improvement philosophy will seek corrective actions that apply both long-term and broadly across the organization. The only vehicle for such organizational learning is the management system. Procedure modifications can fall into this category, with the proviso that any changes to procedures must change the way the work is done in real life.

Investigation teams frequently present modification or addition to the relevant procedure as a corrective action. Provided the change is both relevant to, and effective against, the unplanned event, this may indeed be successful, however, modifying or adding to a broken process such as an unused, or partially used, procedure is not a valid corrective action, and as such will fail the vPSI Test™.

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The vPSI Test™ is a quality check before implementing activities proposed as corrective actions. Such activities must be assigned to a qualified person, signed off on by an appropriate authority, given a reasonable timeframe for completion, and must be both relevant to and effective against what went wrong (in real life). If any of these elements is missing, the proposed activity fails the test and is not a corrective action.

Inside this issue:

Waste to Power: An ESG Case Study

We occasionally like to highlight the work of our client and partner companies. This issue of HEARSay turns the spotlight on XcelPlus International and the work vPSI is doing with them in our ESG practice.

XcelPlus are pioneers in the plasma gasification process, whereby plasma and extreme thermal processes convert waste matter into a synthetic gas and thence to power. Never has there been a practical and economical energy production process that simultaneously rectifies the problems caused by past pollution, prevent future pollution, and develops pure, practical fuel sources as a by-product of its decontaminating processes. This is precisely the value proposition offered by plasma gasification.

With plasma gasification as the harbinger of a new era of energy innovation, observers can expect several facets of the world economy to be reevaluated and altered.

Clean Energy: Aside from the obvious benefits that accompany the clean-up process inherent to plasma gasification – specifically the capability of a single plasma gasifier to obliterate up to 50 tons of trash per day – there is also the revenue generated by the clean energy awaiting at the conclusion of the gasification process.

The gasification process can directly power a generator to supply up to 2.5 mW of power for every ton of waste material disposed of, or it can produce a clean syngas which can be easily converted into any of several clean, green, and desirable energy sources. Whether it's green hydrogen, clean diesel fuel, jet fuel, or a simple waste-to-energy conversion, the production of each of these renewable fuel sources results in tangible progress toward the realization of a specific energy-sector dream.

From Hydrogen Highways, Hydrogen Railways, cleaner trucking, or cities capable of utilizing energy generated entirely by the waste materials that the city produces, plasma gasification can serve as the technology that transforms these dreams into realities.

Sustainability: With more than 13,000 active and inactive landfills presently situated within the United States, this translates into hundreds of thousands of

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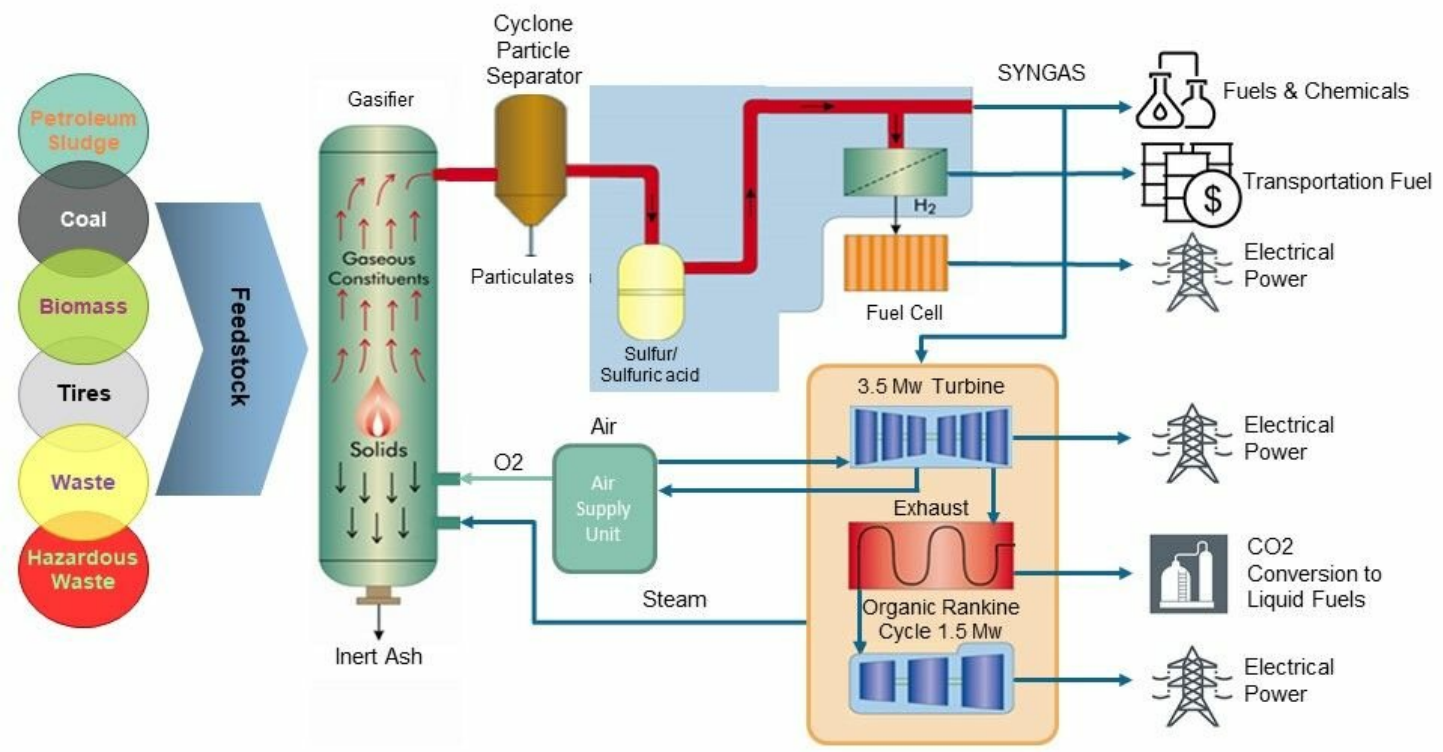

Waste to Power: An ESG Case Study

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square miles of American land that have been polluted, degraded, and reserved for a purpose that undermines its beauty and disregards its potential usefulness.

Plasma gasification has the capability of reversing the landfilling trend, enabling countless acres of non-optimized space to be repurposed for more beneficial endeavors. Thousands of square miles of land can be cleared of waste and debris and renovated into farmland, parks, community developments, or countless other purposes that make far better use of land than the mere collection and storage of man-made garbage.

Carbon Credits: Ever since the creation of carbon credits as a means of offsetting the figurative taxes that governments impose on private companies that pollute the atmosphere, businesses have been engaged in a wide range of activities intended to earn carbon credits, or they have purchased the carbon credits that have been awarded to other companies. Either way, carbon credits were created to incentivize companies to act in the best interests of preserving or upgrading environmental quality.

In addition to gasifying waste and producing environmentally sustainable beneficial fuel sources that can be sold on the open market at a profit, the businesses that eliminate waste and produce fuels through plasma gasification also qualify for carbon credits through those activities. In short, environmentally and sustainably minded companies will be directly compensated for their restorative activities and stand to earn approximately $25 (depending on market conditions) in carbon credits for every ton of carbon emissions they reduce.

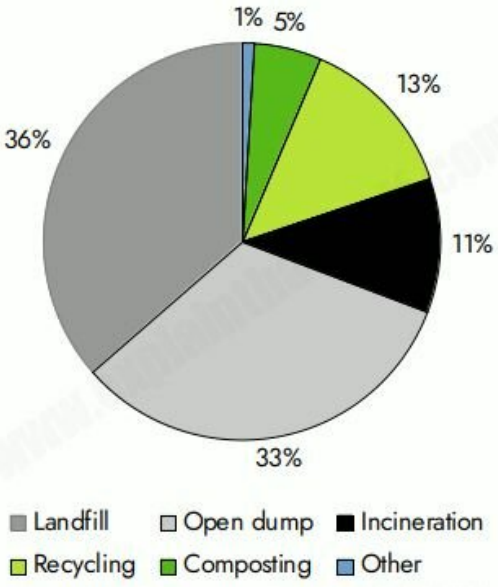

Chart: Where does our waste go?
Source: explainthatstuff.com

Industry Focus: Petroleum: The benefits to human development from the petroleum industry are countless, and the environmental impacts from this industry are equally grand. Plasma gasification has the capability of releasing the energy potential bound up in waste from petroleum operations without generating new emissions. These are numerous opportunities to deploy this clean energy solution in an integrated energy company's portfolio. Wastes such as tank sludges, drilling muds, contaminated soils and more can be converted into new usable power using plasma gasification. On a more local scale, energy companies looking to create microgrids for communities lacking power can utilize plasma gasification to turn community waste into stable reliable power, with all the ancillary benefits that confers.

In conclusion, there has never been a more advantageous time for companies to incorporate plasma gasification into their operating strategies. The fuels and energy sources produced by plasma gasification turn wastestreams into power providing clean, efficient fuels that both businesses and the public can get behind.

Between the opportunity to utilize repurposed property, the capability to produce clean synthetic fuels that will remake industries in an environmentally friendly manner, and the benefit of acquiring government-granted financial incentives, companies now stand to benefit directly and monetarily from their sustainability programs in a threefold fashion. In the race to benefit financially from plasma gasification, the first movers stand to gain everything, and the onlookers will be left to watch as the economy is remade in a cleaner, greener form.

Learning From Incidents: Protips Part 5, Procedure Discipline

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To the right is a snippet showing the before and after of an operating procedure that was modified as the result of an incident caused by step 2 in the procedure being skipped. At this facility, the procedure was never actually referenced by operators who were confident they knew what steps needed to be undertaken to get the job done.

Original	Revised
1. Verify tank is empty	1. Verify tank is empty
2. Ensure the fill line valve is closed / locked out	2. **WARNING Ensure the fill line valve is closed / locked out**
3. Ensure fill pumps are isolated	3. Ensure fill pumps are isolated
4. Start transfer pump	4. Start transfer pump

If this procedure was fulfilling its intent prior to the unplanned event, step 2 wouldn't have been skipped. The problem here is not with the procedure, but with its utilization. This is an example of an activity presented as a corrective action that is unlikely to have any effect on the probability of the unplanned event repeating. In addition, emphasizing step 2 may de-emphasize the steps around it, increasing the likelihood that those steps may be deemed less important by the plant operators and lead to a different unplanned event.

Procedure management is also affected by how competency is managed by the organization. There are advantages to an element of on the job (OTJ) training, where more experienced operators show those less experienced how things work, but there are also major pitfalls, especially where there is a high level of employee turnover. Poor operating practices tend to become ingrained, with "this is how we do it here" prevailing over documented procedures, leading to divergence between work-as-imagined versus work-as-done.

Properly implemented, procedure changes can be real corrective actions, and validation of this using the vPSI Test™ will provide confidence in an investigation's output.

Combining Business with Pleasure

There are few opportunities for travel at the moment, so we're opening up the archive to take a wistful look at past adventures…

In April 2007, vPSI Co-Founder and Director Norman Ritchie traveled to Norway to deliver the vPSI fundamentals workshop to Marathon Oil. While there, he took a moment to visit the Sverd i Fjell (Sword in Rock) in the Hafrsfjord neighborhood in Madla, a borough of Stavanger. This monument was created to commemorate the Battle of Hafrsfjord in the year 872, when King Harald Fairhair joined all of Norway under one crown. The monument also represents peace, since the swords are installed in solid rock and thus cannot be removed. (See Sverd i Fjell on Wikipedia for more information.)

In February 2013, Norman and Angel Simmons, vPSI Senior Consultant, went to the North Slope of Alaska to deliver the vPSI fundamentals training to employees at ConocoPhillip's Kuparuk camp near Dead Horse, Alaska. To the left is a scene from the airplane on the way there, where there is nothing but snow for miles around. The temperature during the trip averaged –41° by either unit of measure, Fahrenheit or Celsius. It was cold enough to rime our nose hairs!