

MEG Strategy Update

08 June 2016





Agenda

1. MEG Strategy
2. TTP MEG project
3. Current Status



1. MEG Strategy

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Our objective - MEG saturation level in the region of 55% achieved by March 2021

The delivery methodology is in several parts;

- Maintenance & Remedial work
- Improved sampling
- Replacement of existing technology
- TTP replacement
 - TTP is the technology developer responsible for innovation MEG fogging project)



2. TTP MEG Project

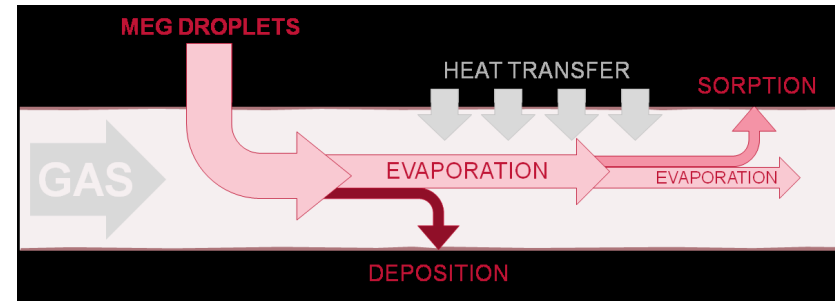
PHASE 1

Aims:

- Demonstrate TTP's TouchSpray Technology can fog MEG
- Work out what a trial device would need to do and how to trial it

Key Outputs:

- Technical feasibility if MEG heated
- Understanding of droplet dynamics in gas main
- Need to create product ahead of trial



PHASE 1

2012

2013

2014

2015

2016

2017



2. TTP MEG Project

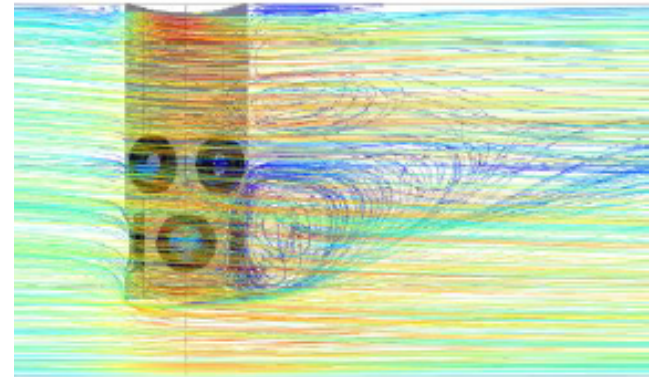
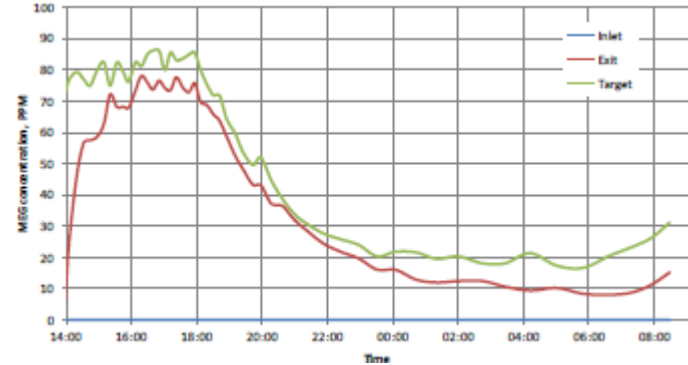
PHASE 2

Aims:

- Show high saturation in air based system
- Validate droplet dynamic model

Key Outputs:

- Test system at TTP
- Excellent performance in warm air, needed longer pipe for cold
- Modelling improved



PHASE 1

PHASE 2

2012

2013

2014

2015

2016

2017



2. TTP MEG Project

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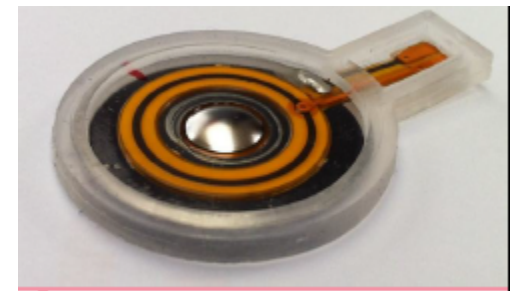
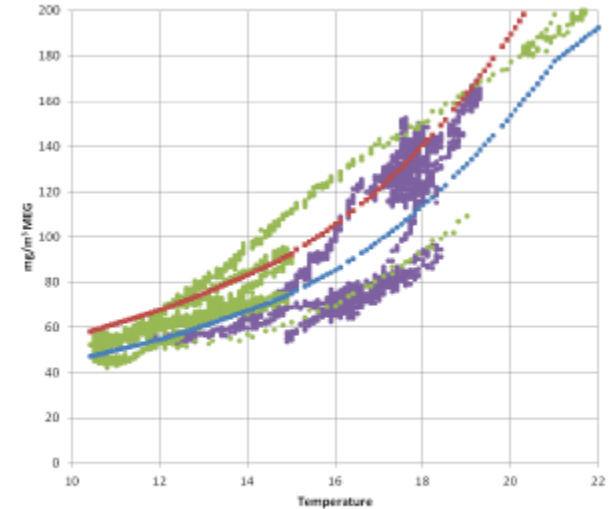
PHASE 3

Aims:

- Extend performance in cold conditions
- Increase head robustness
- Develop saturation monitoring capability
- Agree formal requirements for trial

Key Outputs:

- Performance validated in 100m system: 6-7micron drops
- Improved robustness of spray head
- Selected saturation monitoring equipment supplier and procured unit for testing
- Created suit of formal specification documents



PHASE 1

PHASE 2

PHASE 3





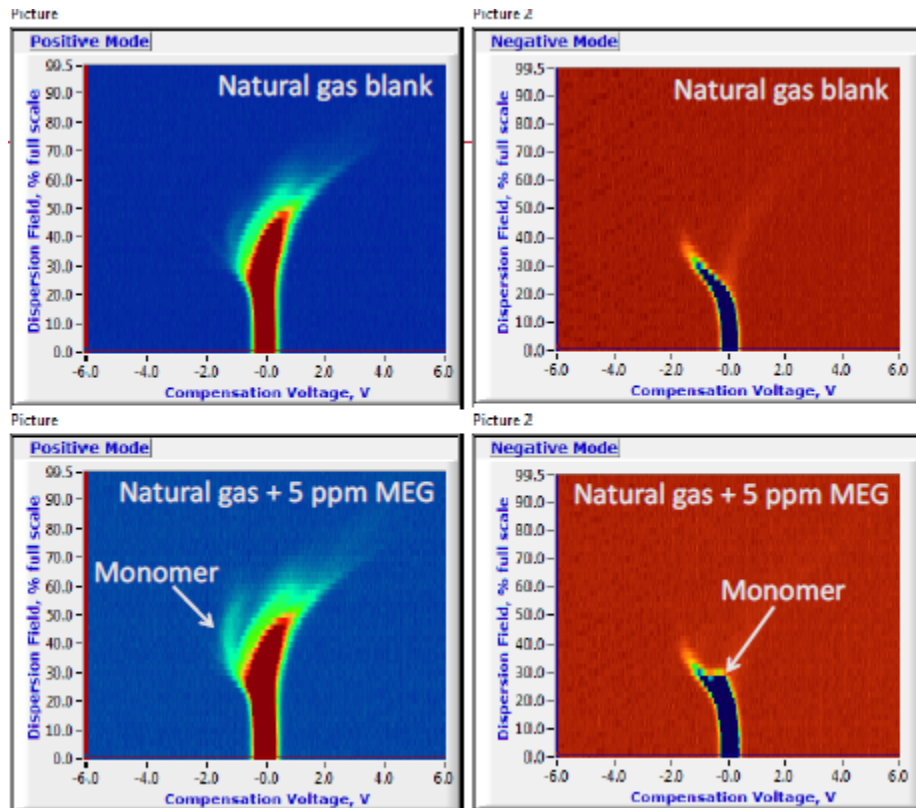
2. TTP MEG Project

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PHASE 3 monitoring

Key Outputs:

- Identified site specific issues during site validation
- Next stage identified



PHASE 1

PHASE 2

PHASE 3

2012

2013

2014

2015

2016

2017



2. TTP MEG Project

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PHASE 4

Aims:

- Finalise architecture
- Complete MEG fogger detailed design
- Complete trial site design

Key Outputs:

- Mech / Elec detailed design
- Prototyping and testing
- Site specific design



PHASE 1

PHASE 2

PHASE 3

PHASE 4

2012

2013

2014

2015

2016

2017



3. CURRENT STATUS / PLAN

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Objective remains unchanged - GD MEG saturation level in the region of 55% be achieved by March 2021

Maintenance and remediation (O&M)

- Revised training & maintenance developed through NGGD Training & Development department
- Roll out 2016/17

Sampling

- Actively progressing since 2014

Replacement with existing technology (Evaporator Replacement)

- Project sanctioned, 9 new evaporators in North London area - Target install starting at end of July 2016
- Beyond 2016 - evaluate & identify next sites





3. CURRENT STATUS / PLAN

TTP MEG PHASE 5 (restructured)

Aims:

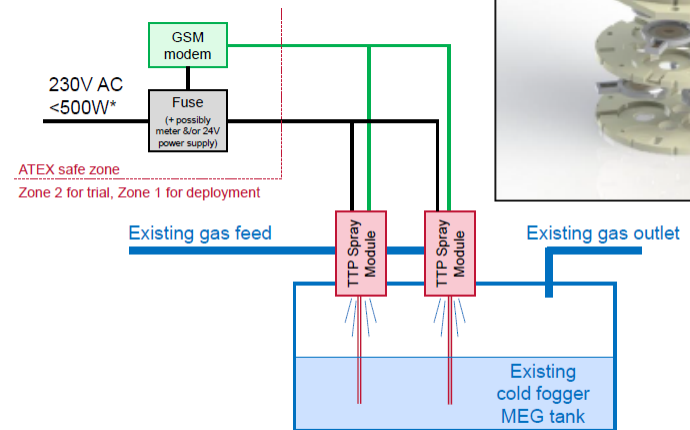
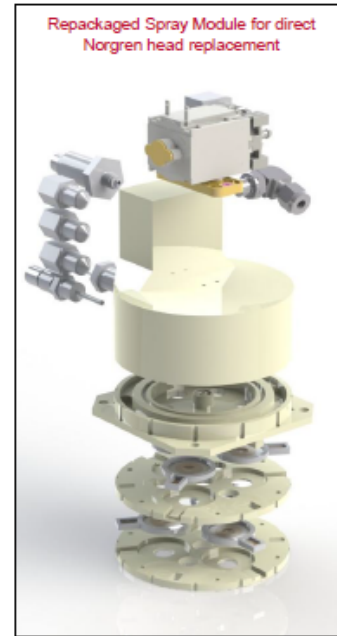
- Repackage the Touchspray heads to replace the Norgren heads used on cold foggers

Benefits

- Deliver core performance of Touchspray heads, including simple proportional control at a fraction of the price
- Increase output, requiring low force gas pressure
- Lower power demand (<500W, single phase)

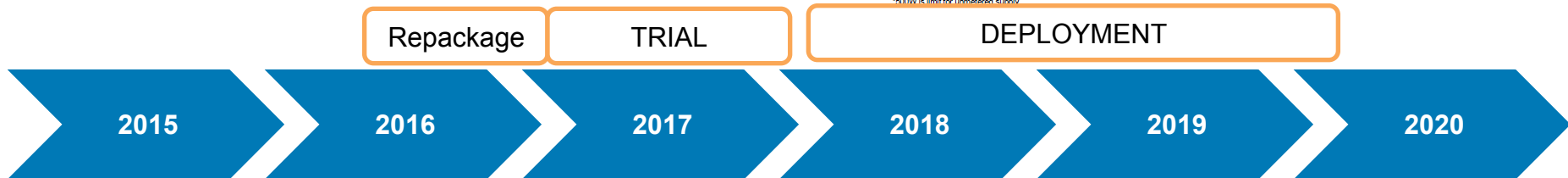
Status:

- Project initiated, seeking sanction
- Trial planned early 2017
- Deployment target early 2018/2019



Each Spray Module would have the same output as six current Norgren heads but only take up the space of one.

*500W is limit for unmetered supply





3. CURRENT STATUS / PLAN

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TTP CONDITION MONITORING

Aims:

- Develop test unit to provided known quantities of MEG
- Validate both current (tube) and new (Owlstone) method

Benefits

- Improved sample methodology and equipment (e.g. stand pipe design / materials, establishing sample stabilisation times)
- Identify site specific anomalies
- Assist with training (demonstration of sample stabilisation)
- Instantaneous readings – site specific problem identification

Status:

- Project initiated, seeking sanction
- 25 week project duration, Deployment target 2018





3. CURRENT STATUS / PLAN

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TTP MECHANICAL COLD FOGGER NOZZLES

Aims:

- Provide replace option the Norgren heads used on cold foggers (for small sites with ATEX & power limitations where Touchspray is not an option)

Benefits

- Fog generation without the need for electricity or high driving gas pressure
- Simple mechanical swap of nozzles
- Potential to introduce simple proportional control

Status:

- Project initiated, seeking sanction
- Phase A Concept development - mid 2016
- Phase B Site trial planned - mid 2017
- Deployment target - mid 2018

