Sharing and Displaying Asset Information

Focus Group outputs

DRAFT

Background

NUAG is recommending that "Record information must be made available in electronic form through a web-based service".

Based on stakeholder feedback, current systems, planned developments for holding and sharing asset information and the significant volume of largely paper-based legacy asset data, this is taken to describe a web portal arrangement, shown in Figure 1, rather than a single, central system. Enquiries are processed and contact made with individual organisation's databases by the web portal. Information returned by each Asset Owner is collated and passed back to the enquirer by the portal, rather than each enquirer accessing each organisation's data separately.
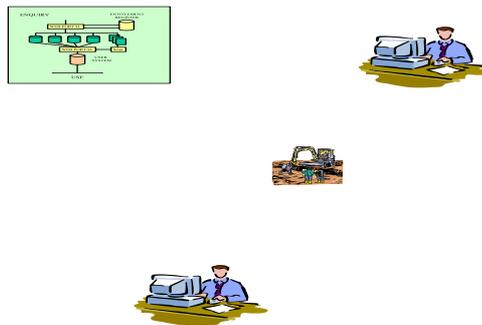

Figure 1 Future web portal arrangement

To best understand stakeholder needs and aspirations, NUAG is holding a series of Focus Groups for a fully representative range of stakeholders to gain organisations' views of current processes and practices in sharing asset data and displaying asset information, both now and in the future.

This document contains the outputs from the PIPELINES Utilities Focus Group held on 19 May 2008. It is set out in four sections:

1. Views as Users of Asset Information.

2. Views as Owners of Asset Information.

3. Views on a Web Portal.

4. General and specific issues to be addressed.

Where references are made to NUAG standards or recommendations, these relate to the NUAG July 2007 Report *A national approach for capturing, recording, storing and sharing underground asset information.* (Can be downloaded at www.nuag.co.uk/outputs). Extracts are reproduced where appropriate, and shown in italics.

1   Views as Users of Asset Information

1.1   Why do you need the information?

1. To ensure safety – full and accurate information underpins safe systems of work.

2. To avoid damage to third party assets as a consequence of work installing and maintaining own assets.

3. To identify third party assets that have been installed in the vicinity of pipeline assets that may threaten their integrity, and then to assemble a picture of who installed what, and where, and when.

4. To identify third party assets installed within a pipeline easement without consent, that may affect rights of way in the easement, and then to assemble a picture of who installed what, and where, and when.

5. For planning long-term projects, typically installing new pipelines and ancillary assets.

6. For scheduling and managing work on site:

    a. Planned.

    b. Reactive: short term works typically resulting from inspection of existing assets.

    c. Emergency.

1.2   What types of enquiry?

1. Asset protection: investigating potential and/or actual third party installation within the vicinity of a pipeline, and/or within an easement.

2. Long-term planning work.

3. Short-term planning work.

4. Executing planned and reactive work.

5. Executing emergency work.

1.3   What information do you need?

Asset protection: sufficient information is needed to understand fully what assets have been installed, and where they are in relation to pipeline assets. In addition, information is needed, wherever possible, on parties involved and a chronology of events.

Planning and executing work: sufficient information is needed to allow accurate location of assets within a specific area, as part of safe systems of work (all guided by HSG47). Such systems are based on an assumption that 'there is something there', and record information is used as the first part of a three-stage process: (1) Obtain records. (2) Sweep site using locating technologies. (3) Dig carefully.

NUAG's Standards for *Minimum Attribute Data* (8.1.6) and *Data Quality Standards* (8.1.7) are an acceptable minimum set of information to meet these requirements, with the addition of 'Nature of asset' e.g. LV or 100 bar, as such information will guide planning, design and construction approaches.

Geographic scope of information depends on job type; long-term planning may encompass large areas and long distances, while short-term planned and reactive, and emergency works will generally focus on much smaller geographic areas.

1.4   Who do you need to ask?

Every organisation or individual that may have assets under the street or away from the street, including Statutory Undertakers, Highway Authorities (who should hold registers of promoters of street works in their area), and anyone else known to have a possible interest.

A Register of Owners is needed (See Issue 17).

1.5   When do you need the information?

The NUAG *Time Standard* (8.1.1) for share asset data and display asset information:

> *Asset information for the area of enquiry based on digital data held electronically should be made available as quickly as possible, and no longer than one working day.*

> *Asset information for the area of enquiry based on paper records should be made available as quickly as possible, and no longer than five working days.*

> *This standard does not apply to emergency enquiries.*

is deemed acceptable.

Electronic records should, in theory, be capable of an 'immediate' return, subject to an acceptable definition of 'immediate'. Response time will be dependent on system capability and data transmission speeds. It is reasonable to assume that 'immediate' equates to a maximum of two minutes. A five day response for paper-based records is acceptable.

Service availability has to be 24/7 to cater for emergency works.

1.6   Who needs the information?

Office-based staff for planned and reactive work, and site staff for reactive and emergency work; these tend to be the same set of people.

1.7   Where is the information needed?

Potentially anywhere in the organisation: in the office, in the field, or on site.

Pipeline organisations' works are within the street, and away from the street.

1.8   Where can requests for information originate?

Potentially anywhere in the organisation: in the office, in the field, or on site.

1.9   What information should be provided when making an enquiry?

NUAG's recommended enquiry parameters (8.5.9) are seen as acceptable:

1. *Either singly or in combination from:*

   a. *Grid Reference(s) relating to a centroid or polygon.*

   b. *Address.*

   c. *Postcode.*

   d. *Unique Reference Number (TOID/USRN).*

   e. *Domains of interest e.g. all highways; all utilities; specified subsets of highways; specified subsets of utilities.*

   f. *Timescales, including start and duration.*

   g. *Type of enquiry i.e. what is information needed for?*

Any polygon(s) must be defined as closely as possible to the exact area needed, rather than over a much larger area, on a 'just in case' basis. Where enquiries cover a relatively widespread geographical area, they should be defined as a polygon, rather than as a series of sub-polygons, leaving the Owner's system to deliver information at an appropriate level of detail.

Consideration should be given to providing a map on screen on which a User could indicate a point of interest, or draw a polygon of interest, which would remove the need for such a full set of parameters.

1.10   In what form should the information be provided?

NUAG's recommendations (8.5.4 and 8.5.6) are seen as acceptable:

1. *A read-only image file of geospatial and physical asset information for each specified domain requested, consistent with agreed entitlement rights, in vector digital data form with associated metadata, against a large scale vector map background.*

2. *A read-only image file of geospatial and physical asset information for each specified domain requested, consistent with agreed entitlement rights, in vector data form such as Adobe PDF (scanned paper records).*

3. *Information provided should be DNF-compliant and compatible with OGC standards e.g. GML.*

4. *Information must be made available in electronic form through a web-based service:*

   a. *with scale shown;*

   b. *with a key to symbols;*

   c. *with orientation shown, and*

   d. *suitably referenced to a geographic location (map background; DNF, nationally consistent gazetteer).*

Users wish to have some choice as to how they use the information provided, either as a print, or as a single layer of information, or as a set of layers merged into one (but with User control over which layers). There is a perceived need for paper prints to be given to 'the guy in the hole', both now and in the near future, although the ultimate aim has to be computer-based information and systems, both in the office and on site.

Some organisations may choose to upload received information onto their own GIS systems (although currency of data will be an issue). Electronic data will clearly fit easily; PDF records originating from paper records will need to be digitised and fitted onto GIS via AUTOCAD, or a similar product.

1.11 How much information should be provided?

As much as is needed to do the job (see 1.3), consistent with NUAG's recommendation (8.5.6):

> *Comprehensive information should be provided, subject to an enquirer's entitlement rights consistent with the Asset Owner's policy for providing asset information.*

A reasonable set of information would include: nature of asset (e.g. LV or medium pressure); material; size of asset; location of asset (relative and absolute); depth or top of asset; domain; owner, and a measure of accuracy (which may be related to date of asset, or date of record). The information should include all assets, including live and abandoned.

As a minimum, an image file should be provided for each Owner; if an Owner holds information as a number of domains e.g. a gas company may hold records of low and medium pressure assets as separate domains (as separate layers), a file should be provided for each.

Issues relating to potential future systems for improved presentation and visualization of information include:

1. Planning, design and execution of works inevitably involve judgement calls by staff, and more comprehensive and accurate information leads to better decisions. Whilst every asset should be treated as critical (e.g. capable of causing a risk to health and safety, or posing a risk to service if damaged), the set of information specified in the preceding paragraph should enable criticality to be determined, so a means of illustrating graphically or pictorially relative accuracies could be beneficial.

2. Clarity of information is critical. Any bundling of multiple lines must be clearly indicated, and the underlying detail readily available; any other approach is considered to be potentially dangerous. The use of colour to discriminate lines is acceptable, but there may be a problem in highly-congested areas where the available palette of colours may be insufficient.

3. The adoption of a national common symbology is seen as a laudable aim, but is questionable in terms of value to the pipelines sector (sensitivity of information may lead to a reluctance to share too much detail e.g. valves).

4. 3D representation of information must be the way ahead, but would have to be treated with caution – its worth will depend on how representative it is of reality, and that in turn depends on the quality of the underlying asset record data. There are clear behavioural issues associated with data presented on a computer screen. (See Issue 14)

1.12 Emergency enquiries

As much information as is available electronically should be obtained, including 'we have no assets in the area' responses to allow accurate location assets within a specific area, as part of safe systems of work (all guided by HSG47). Such systems are based on an assumption that 'there is something there', and record information is used as the first part of a three-stage process: (1) Find records. (2) Sweep site using locating technologies. (3) Dig carefully.

A Register of Owners that may have an interest in the specified area (Section 1.4) is needed. This would also return contact details for all organisations that have not responded to enable direct contact, if appropriate.

2   Views as Owners of Asset Information

2.1   What type of enquiries are you willing to respond to with information?

All types of bona fide enquiry, including:

1. Long- and short-term planning;

2. scheduling and executing planned work;

3. emergency work;

4. commercial and legal

although responses may differ for different types.

NUAG's recommendation for Managing responses to enquiries (8.5.10) is acceptable:

1. *Each Owner should develop and maintain policies, processes and systems for providing asset information that:*

    a. *ensure compliance with the minimum performance standards set out in this Section;*

    b. ensure compliance with all relevant legislation;

    c. are consistent with the need for commercial sensitivity and/or national security;

    d. help protect their asset base;

    e. are secure, and

    f. facilitate safe systems of work.

The Linesearch.com website provides a standard interface between enquirers and Linewatch member organisations, as follows:

1. A User enquiry is made by entering location details, start date, type of work, coverage (distance of work involved) and a reference number.

2. The system identifies whether any member organisations have assets within the area of interest.

3. If no member organisations have assets in the area of interest, a 'not affected' response is returned.

4. If one or more member organisations has assets in the area of interest, the enquirer is asked to forward details of the planned work to specified organisations whose contact details are shown. Generally, record information will be returned to the User within five working days of receipt of the requested information. There is scope within the Linewatch processes, particularly for larger projects, for this initial consultation to be followed by a multi-stage communication to establish and meet a User's requirements.

5. If one or more member organisations has assets in the area of interest, and the User's enquiry is associated with emergency works, the User is given a telephone contact number, which will result in a Linewatch member organisation representative visiting the site.

In addition to a web service, there will always be a need for a non-web service to cater for paper-based enquiries from small organisations or individuals who do not have web access.

2.2   Who are you willing to provide information to?

The Linesearch facility is available to registered Users (including Statutory Undertakers, Highways Authorities, and commercial and legal organisations), and is free of charge to all Users.

NUAG's recommendation on *Entitlement* (8.5.12), shown below, is acceptable:

> *Each Owner should develop and maintain an Entitlement Register, consistent with their policy for providing asset information based on:*
>
> • *the status of the enquiring organisation;*
>
> • *nature and scope of information requested;*

- *the use to which information will be put; and*

- *timescales for use of the information.*

The concept of a Register described in Section 1.4 is seen as a good one, to help ensure that an Owner is always consulted, as far as is possible, and given the opportunity to safeguard the organisation's assets.

Each User must be registered, and each access subject to password control.

Mechanisms need to be in place to monitor usage to check repeated and/or irregular patterns of usage, particularly by individuals, to alert Owner organisations to possible breaches of their policies, and to maintain commercial confidentiality.

2.3   What information do you need from an enquirer?

NUAG's recommended enquiry parameters (8.5.9) are acceptable:

1.   *Either singly or in combination from:*

    a.   *Grid Reference(s) relating to a centroid or polygon.*

    b.   *Address.*

    c.   *Postcode.*

    d.   *Unique Reference Number (TOID/USRN).*

    e.   *Domains of interest e.g. all highways; all utilities; specified subsets of highways; specified subsets of utilities.*

    f.   *Timescales, including start and duration.*

    g.   *Type of enquiry i.e. what is information needed for?*

Consideration should be given to providing a map on screen on which a User could indicate a point of interest, or draw a polygon of interest, which would remove the need for such a full set of parameters.

2.4   What timescales are acceptable for providing information?

The NUAG *Time Standard* (8.1.1) for share asset data and display asset information:

> *Asset information for the area of enquiry based on digital data held electronically should be made available as quickly as possible, and no longer than one working day.*

> *Asset information for the area of enquiry based on paper records should be made available as quickly as possible, and no longer than five working days.*

> *This standard does not apply to emergency enquiries.*

is deemed acceptable.

Electronic records should, in theory, be capable of an 'immediate' return, subject to an acceptable definition of 'immediate'. Response time will be dependent on system capability and data transmission speeds. It is reasonable to assume that 'immediate' equates to a maximum of two minutes. A five day response for paper-based records is acceptable.

Service availability has to be 24/7 to cater for emergency works.

The Linesearch website stipulates a 28-day validity period for information supplied; if not used within 28 days, a User is asked to repeat the enquiry.

2.5   What information are you willing to provide?

As much as an Owner believes to be necessary to fulfil an enquiry, or as much as is subsequently agreed with a User , consistent with NUAG's recommendation (8.5.6):

> *Comprehensive information should be provided, subject to an enquirer's entitlement rights consistent with the Asset Owner's policy for providing asset information.*

Information provided should be some or all of the following, subject to agreed entitlement: nature of asset (e.g. LV or medium pressure); material; size of asset; location of asset (relative and absolute); depth or top of asset; domain; owner, and a measure of accuracy (which may be related to date of asset, or date of record). The information should include all assets, including live and abandoned.

2.6   In what form will you provide information?

NUAG's recommendations on *Outputs* (8.5.4) and *Information Standards* (8.5.6) are acceptable:

1. *A read-only image file of geospatial and physical asset information for each specified domain requested, consistent with agreed entitlement rights, in vector digital data form with associated metadata, against a large scale vector map background.*

2. *A read-only image file of geospatial and physical asset information for each specified domain requested, consistent with agreed entitlement rights, in vector data form such as Adobe PDF (scanned paper records).*

3. *Information provided should be DNF-compliant and compatible with OGC standards e.g. GML.*

4. *Information must be made available in electronic form through a web-based service:*

   a. *with scale shown;*

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   c. *with orientation shown, and*

   d. *suitably referenced to a geographic location (map background; DNF, nationally consistent gazetteer)*

All information should include a disclaimer on accuracy. This is likely to remain a requirement, even in the longer-term.

In terms of recommendations 1 and 2, information should be provided as read-only. Access to live data, which can be taken and manipulated by a third party, presents too much of a risk to the Owner organisation's integrity, and must not be permitted at any time.

3   Views on a Web Portal

1. Any web-based system has to be foolproof.

2. The Linesearch.com website is based on a great deal of user research, which may be beneficial in developing NUAG's ideas.

3. Appropriate web-based technologies are available now, but there is no hardware currently that is rugged enough to cope fully with use on site.

4. Web-based systems have to be easy to use, particularly on site. The challenge is to make them useable by operatives whose primary skill is digging a hole; the solution may need innovative features e.g. cartoon format.

5. Any system has to have a multi-lingual capability to reflect the international nature of the workforce; requirements for languages other than English may vary dependent on geography within the UK.

6. Electronic records should, in theory, be capable of an 'immediate' return. Response time will be dependent on system capability and data transmission speeds, and it is reasonable to assume that 'immediate' equates to a maximum of two minutes. An on-screen calculator that shows likely response time/progress may be a useful feature to incorporate.

7. A five day response for paper-based records is acceptable.

8. Colourblindness, dyslexia and similar conditions are real issues to sufferers, but may distort the overall picture – is it reasonable to design a web system that aims to achieve the lowest common denominator?

9. Any system developed for site use should be GPS-enabled (at least in the longer-term, as GPS accuracy improves).

10. Experience shows that new systems and technologies can be introduced onto site, but success depends on proper education, training and support.

11. Web service should be available throughout the UK.

4   Issues

1. The relatively high price of Ordnance Survey maps will continue to militate against widespread use of the most accurate versions unless more reasonable prices apply. There is an argument that map information should be free, or near free, particularly on health and safety grounds; this would unlock a great deal of its potential, and encourage much wider use, leading to more accurate information.

2. There are behavioural issues ensuring people work to a process.

3. Pipeline organisations (essentially the UK transmission industry) are not treated as Statutory Undertakers in the street (<5% of assets under the street).

4. Currency of asset record data is an issue.

5. Highway authorities hold registers of both Statutory and non-Statutory consultee organisations, and a register of streets with special engineering difficulties (in this case, major pipeline crossings under the street). There is a variable approach across the country, with some authorities reluctant to hold details of pipeline organisations and their assets on their registers.

6. In general, reciprocal arrangements apply for charging for asset information, with no charge on a quid pro quo basis. Some water utility companies have asked for payment, but to date this approach has been successfully resisted (although at least one water company charges for some data as part of its outsourced contract).

7. NUAG's recommended performance standards for accuracy (standards i and j in *5 Minimum performance standards)* are achievable now, but only through the use of expensive equipment and highly-trained staff. Their ultimate achievement rests on the availability of easily-useable equipment at affordable costs. Significantly improved high quality GPS coverage is also needed across the whole of the UK; currently there is variable coverage in places, and the 'urban canyon' effect causes problems in built-up areas.

8. NUAG's definition of *Relative referencing* (8.1.3) needs to be reviewed – a kerb can be moved!

9. An additional attribute 'Nature of asset' should be added to NUAG's *Minimum Attribute Data* (8.1.6) e.g. 32 KV, High Pressure, 100 bar; this information is needed to determine approach on site.

10. The principles underlying the NUAG Standards for *Historical discrepancies* (8.2.3.1), *Unidentified Buried Objects* (8.2.3.2) and *Third party interference* (8.2.3.3) are acceptable, but there is concern over their practicality. If a discrepancy is found in own records, do you have to expose the whole asset to ensure it is fully and 'properly' recorded (and at what cost?)? A second issue is certainty: how certain are you that what you have found is what you were expecting? How can you be absolutely sure about ownership? Given the emphasis on cost, will a gang really be concerned to find the rightful Owner? There is a suspicion that all discrepancies etc. would become a UBO, or would be ignored.

11. Subject to the issues described in point 10 above, NUAG's Standards for *Historical discrepancies* (8.2.3.1), *Unidentified Buried Objects* (8.2.3.2) and *Third party interference* (8.2.3.3) can only work if made mandatory.

12. CDM 2007 Regulations impose a duty to hold a Health and Safety file for your facilities; this should include anything that may present a future risk to people. This implies that all assets should be recorded. In practice, compliance appears variable, and CDM does not cover everything e.g. smaller jobs.

13. Some organisations do not share information on abandoned assets, only live assets. Both sets of information should be shared.

14. Data in electronic format is likely to be assumed as accurate – the 'computer is always right syndrome.

15. Providing information is viewed by some organisations as an income stream. Linesearch/Linewatch's experience suggests that the availability of free information stimulates usage. Information should be free.

16. Instant availability of information on site and on demand must not be allowed to circumvent proper planning.

17. A comprehensive and current Register of Owners is needed to record, ideally, all organisations and their areas of interest i.e. may have assets in an area. As well as the more obvious Statutory Undertakers and Highways Authorities, there is a myriad assortment of organisations, both public and private. In some areas, ownership of assets is unknown or unclear, a problem that is getting worse as companies split up and/or change ownership.

18. Little effort seems to be made to establish provenance of 'unexpected' assets found during excavation work. Lack of information may pose a significant safety risk, so better efforts must be made to establish ownership – it is not acceptable to drill into a pipe 'to see what's in it'.

19. Response times – there appear to be conflicting timescales between regulatory and internal standards and, on occasion, the amount of work to be done.

20. Is NUAG's *Accuracy Standard* (8.1.2) appropriate for all assets, or should there be a sliding scale approach to reflect criticality? Should critical assets (more dangerous and/or important) (see 1.11) be recorded at a higher accuracy than less critical?

21. In general, more spatial features are available for works in the street than for works away from the street; this is a particular problem for works in fields in rural areas. NUAG's *Referencing Standard* (8.1.3) for relative referencing should be reviewed to ensure adequate referencing of assets away from the street.

22. Even with a web-based service in operation, there will still be a need for a paper-based system that caters for small organisations e.g. agricultural contractors, and individuals who do not have web access.

Appendix 1 – Delegates

Name	Organisation
Kevin Bosanquet	Fisher German (Linewatch)
Guy Hemsley	British Pipeline Agency Ltd
Tony Gillard	Shell European Oil Products (& UKOPA)
Linton Haw	Sabic UK Pipelines
Robert Stockley	National Grid
Carl Sadler	SGE (GPSS)
Andrew Jackson	Fisher German (representing Esso Petroleum, Mainline Pipelines, Linesearch)
David Butterfield	Oil & Pipelines Agency