

1. It has been suggested that in all NOS units, the words **‘where the voltage is considered dangerous.’** should be removed from all instances of the Electric Vehicle definition, because it adds no value, unless there is also a definition of ‘dangerous’. This definition appears in the overview sections and scope/range or glossary of all units.
 - 31 respondents agreed, however 7 did not, and highlighted that the removal of the word ‘dangerous’ could lead to complacency.
 - ***It was decided to keep the original wording.***

2. It has also been suggested that the glossary entry for ‘high voltage’ be amended to include **‘N.B.: Some electric vehicles may operate at voltages outside of these parameters.’**
 - 35 respondents agreed, however 3 did not, and suggested this statement might lead to confusion.
 - ***It was decided instead to amend wording to ‘N.B. Some electric vehicles may operate at voltages below or above industry recognised standards.’***

3. In all relevant units, ‘the implications of electrical conductivity through the human body’ has been amended to ‘the effects of electricity through the human body’.
 - 36 respondents agreed, however 2 did not, and suggested that the word ‘implications’ allows for a degree of possibility, rather than certainty.
 - ***It was decided to amend the wording to ‘the implications and effects of electricity through the human body’.***

4. In all relevant units, ‘alternative fuel sources’ has been amended to ‘all fuel sources’.
 - 35 respondents agreed, however 3 did not, and suggested that the removal of the word ‘alternative’ might cause confusion.
 - ***It was decided to amend the wording to ‘all fuel sources, including alternative fuels’.***

5. IMIEV01 - Carry out non high voltage operations on, near or with an electric vehicle

Because this unit is aimed at those working with/around an EV but not actually on the high voltage system itself, the use of PPE has been removed. Being able to safely charge the vehicle has also been removed.

In the overview, the examples of relevant job roles has been amended.

P3 – the word ‘work’ has been replaced by ‘operate’

P3.1 – ‘mimises’ has been replaced by ‘avoids’

P4 – ‘problems with’ has been replaced by ‘concerns about’, as the non-technical person might have a concern without knowing it is a problem with the vehicle.

K6 – knowledge has been amended to reflect changes in P3 and p3.1

New K12 added

K15 – ‘the charging systems associated with electric vehicles and how to use them safely’ has been amended to ‘how to safely charge a vehicle

New K16 added

New K17 added

New K18 added

- 26 respondents agreed, however there were concerns these changes would lead to assumptions that ‘anyone can do it’.
- ***This NOS is aimed at all those working with EVs (Service Receptionist, Valet etc.) but not on the high voltage system itself; it is just about ensuring awareness and that certain precautions need to be taken. In addition, the overview includes a warning reminder that this standard does not indicate competence to work on a high voltage system. Therefore, it is a NOS for anyone and as such the amendments will be made as suggested.***

6. IMIEV02 – Provide a first response to a broken down or damaged electric vehicle

This NOS has been split out into two separate units, one for all first responders, and the other for dealing with unstable high voltage systems and an escalating emergency situation. These units are being finalised with the support of the emergency services. A new unit for damaged EV recovery has been developed – see unit IMIEV09.

7. IMIEV03 - Remove and replace components in an electric vehicle high voltage powertrain and ancillary systems

New K4 added

New K50 added

- All 27 respondents agreed, although it was also pointed out that ‘the implications of remotely operated CCTV systems’ might need to be considered.
- ***As a result, this additional statement was added to ALL NOS units - ‘The implications of video recording equipment on a vehicle and the relevant workplace procedures to follow if fitted’.***

8. IMIEV04 - Isolate and re-energise high voltage systems in an electric vehicle

P6 – amended to include ‘following workplace procedures’

New P12 added

K9 – amended to select, check and use

New K12 added

K20 – ‘calibrate’ amended to ‘check’

Scope/range 3 – components list amended and added to

- All 27 respondents agreed.

- **Amendments will be made as suggested.**

9. IMIEV05 - Diagnose and rectify faults in an electric vehicle powertrain and ancillary systems

Overview amended to include '**NOT including the high voltage battery**, which is covered by a separate NOS (IMIEV10).' Also warning amended to include '**This may involve some diagnostic testing on the live system, appropriate to the level of competency.**'

New p2 added

New P18 added

New K11 added

K42 – 'insulated earth return' amended to 'insulted return'

New K51 added

Scope/range 5 - amended and added to

- All 27 respondents agreed.
- **Amendments will be made as suggested.**

10. IMIEV06 - Test, remove and store electric vehicle high voltage batteries

P7 – 'diagnostic' removed

Old P7 removed – 'Correctly interpret the results obtained from the diagnostic test equipment'

P10 – reference to glossary added

New P12 added

New K8 added

K10 – amended and glossary reference added

Old K19 removed – 'How to calibrate electrical test equipment prior to use'

Old K21 removed – 'How to carry out tests and procedures to determine the condition of the battery cells or modules'

Old K22 removed – 'How to use diagnostic and test equipment and interpret the results to ensure the integrity of the high voltage system, the state of charge and state of health'

Scope/range 2 – amended and added to

Scope/range 3 – 'scan tools' removed

Glossary – addition of new definition 'Suitable isolated area'

- All 25 respondents agreed.
- **Amendments will be made as suggested.**

11. IMIEV07 - Remove and replace components in a hydrogen fuel cell electric vehicle system

New P4 added

New P9 added

K4 amended to include 'hazardous and explosive atmosphere zone classifications'

K6 amended to include zone classification and reference to safety equipment

New K8.1 added

K9 amended

K10 amended to include testing and monitoring

K26 amended to include 'advantages for automotive applications'

K28 amended to include examples

K30 amended to include 're-fuelling' and 'on-board'

K31 amended from 'types' to 'methods'

New K32 added

New K33 added

Section 'Vehicle equipment faults and their correction' removed – new section inserted 'Vehicle component faults/condition and their correction'

Section 'Use of tools and testing equipment and testing techniques' removed (applicable to IMIEV08)

New Scope/range 1 added re PPE

Scope/range 2 amended re working environment equipment

New Scope/range 3 added re tools and equipment

Scope/range 5 amended and added to.

- All 26 respondents agreed.
- ***Amendments will be made as suggested.***

12. IMIEV08 - Diagnose and rectify faults in a hydrogen fuel cell electric vehicle system

Overview to include N.B regarding use in conjunction with NOS IMIEV05, and that both high voltage and high-pressure systems will be live.

New P4 added

New P9 added

New K5.2 added

New K6 added

New K7 added

New K9.1 added

New K10 added

New K11 added

K12 amended to include testing and monitoring for hydrogen leaks

'Hydrogen fuel cell and the vehicle system principles' section – all units in this section to refer to fuel cell, not PEM specifically

K28 amended to include re-fuelling systems

New K30 added

New K31 added

K40 amended to include examples

New scope/range added – 1 and 2, and scope 3 amended

Scope 6.6 amended to include 'purge'

Glossary amended to include 'Faults' definition

- All 26 respondents agreed.
- ***Amendments will be made as suggested.***

13. NEW IMIEV09 - Recover a broken down or damaged electric vehicle (derived from IMIEV02)

Overview amended to focus upon recovery services.

P4 – 'dynamic risk assessment' added

New P7 added

New P8 added

New K3 added

K7.2 – 'dynamic risk assessment' added

New K7.5 added

New K10 added

K14 – amended to include 'on and off the highway'

New K15 added

K21 amended to include 'recovery techniques'

K24 – 'moving' added

New K26 added

New K27 added

Glossary entry for 'Sources of information' amended to include DFT guidance

Glossary entry for 'Work activities' amended

- 24 respondents agreed, however 2 had reservations around some of the wording being used, and the need to include a notice of work carried out.
- **Following discussions it was decided to make the following amendments:**
 - **P7 now reads 'safe and appropriate'**
 - **New glossary entry added – 'Handover procedure – to include mark up of vehicle and detailed incident record, including hazards encountered and actions taken.'**

14. New IMIEV10 - Diagnose and rectify faults in, or determine the condition of, electric vehicle high voltage batteries

Do you agree this new unit is complete and fit for purpose?

- 23 respondents agreed, however 2 had concerns regarding electrolyte neutralising compound and arc flash PPE.
- **As a result, these items have been added to PPE listings in all relevant NOS.**

15. New IMIEV11 - Carry out electric vehicle conversion (re-powering)

Do you agree this new unit is complete and fit for purpose?

- 24 respondents agreed, however 2 did not, and there was concern that the relevant legislation might not support EV conversion activity at all.
- **Following detailed discussions with subject experts, it was agreed that although the NOS itself is robust, it may not be possible to develop a product based upon it, without the relevant legislation and regulation being in place. The NOS will be published but caution will need to be exercised when utilising for training or qualifications development. Notification of this will be added to the front page overview.**

16. Do you think the EV NOS should be made available in Welsh?

- 17 respondents agreed, but 9 did not. There was some concern that technical terminologies might be lost if the translation was not carried out by someone with the relevant technical skills and knowledge.
- **These results will be discussed with devolved nation representatives before a decision will be made regarding translation into Welsh.**