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| Overview | This standard covers the competence to identify and report variations in electrical, instrumentation and control systems. Logical fault finding techniques are applied to identify the variation. The extent and nature of the variance is recorded and reported. Back up systems to reduce the effect of the cause of variance effect are agreed and implemented.  **Target Group**  This standard applies to individuals at the operational level with responsibilities for electrical, instrumentation and control systems on tugs operating on inshore waters, and at a management level with responsibilities for electrical, instrumentation and control systems on small ships. |

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| **Performance criteria**  You must be able to: | 1. identify variances in accordance with established safety rules and regulations 2. select systems and procedures to correctly identify the extent and nature of the variance in accordance with organisational engineering practices 3. apply fault finding techniques and accurately identify and record the extent and nature of the variance 4. accurately identify the effect of the variance on associated machinery and interfaced systems 5. report the information on the variance to the appropriate person promptly 6. identify and agree the most appropriate back up or standby system to reduce the effect of the variance 7. activate the agreed back-up or standby system in accordance with established safety rules and regulations 8. monitor the variance and operational condition of alternative selected 9. complete and record all details in accordance with organisational and statutory requirements |

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| Knowledge and understanding  You need to know and understand: | 1. the principles of operation and constructional details of electrical, instrumentation and control systems 2. the safety requirements for working with vessel shipboard electrical systems 3. the construction and operation of electrical test and measuring equipment 4. the identification of variances in electrical, instrumentation and control systems 5. test procedures and technical requirements of tests 6. the methods required to isolate variance and initiate back-up and standby systems 7. equipment and circuit monitoring methods and procedures 8. the use of internal communication systems and effective forms of communication. 9. the importance and use of records for commercial and legislative purposes. 10. the application of Statutory Regulations and guidelines, organisational instructions and guidance and vessel contingency plans |

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