**Embarked personnel power requirements capture**

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| Threshold | Comment | Objective | Comment |
| Now | | | |
| **“Get out of platform with same energy I went in with”**  To power soldier system to prevent battery drain  Average power of 10-15 W is typical but with pulses up to 50 W.  ‘Clean’ dc power  Vehicle shall ‘self protect’ its electrical system  Placement of the interface should not encumber the DSS | Peak power needs to be considered. Worst case is all systems peaking at the same time but unlikely. Even more unlikely if soldiers turn off their radios in platform.  Average power puts far less strain on vehicle system but the soldier’s battery would then need to remain connected to manage pulses and would still drain if cannot recharge.  Quick disconnect may be a requirement and should be discussed. | **“Get out of platform with a full battery”**  To recharge soldier batteries.  The recharge time will depend on both the battery and the power available.  A reasonable assumption is 1 hr recharge for a 100-140 Wh central battery today.  This equates to >100-140 W per port for each soldier.  100 W seems a reasonable supply limit from a vehicle based on current connectors etc.  Many batteries will be limited to a 5 A input at 10-20 V.  In most cases batteries won’t be completely flat.  The power can be greatly reduced if charging time can be increased e.g. half the power if can charge over 2 hours. | To recharge a battery doesn’t only need sufficient power but also a charging circuit.  This will require voltage control and comms to the battery.  Some soldier hubs have this built in and can charge batteries using a raw voltage, **the majority fielded do not**.  Charger inefficiency will increase vehicle power demand.  The charger will need to communicate to the battery using SMBus protocol.  Essentially this would be a small individual charger for each soldier, versus a bulk charger for all soldier batteries that has traditionally been used.  100-140 W for 4-8 soldiers may not able to be sustained by vehicle auxiliary power, especially on legacy platforms that can barely power their upgraded electronics. |
| Future | | | |
| Future systems may pulse above 100 W.  Average power may increase to 20-50 W  ‘Clean’ dc power | Future soldier power is expected to increase but will all this equipment need to be powered in a vehicle. E.g. future radios, electronic warfare etc.  HUDs may be the use case for high data rate to the soldier from platform sensors e.g. see-through hull for permanent SA. This will also be power hungry. However will this be wired or wirelessly communicated? | In future considering larger e.g. 300 Wh batteries so may need 300 W for a 1 hr recharge.  User may have to accept a slower charge since 300 W seems excessive for an interface to a soldier with a relatively small connector.  Therefore power may still be limited by connector size. It could perhaps be increased to 150 W since some small connectors may increase from 5 to 7.5 A | Future battery comms may be USB PD 3.0 not SMbus though this has yet to be decided.  This will affect any charging circuit and connector pin requirements.  At some future point the interface to a dismounted soldier could be some form of USB 3 or 4 that can do both power and data in the same connector.  Note USB 3 PD 3 limited to 100 W. Future iterations may increase this. |