

石油修井作业机钢丝绳断裂失效研究

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Title: Research on fracture breakage failure for wire rope of oilfield workover rig

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摘要: 石油修井作业机钢丝绳断裂失效给人身安全和设备带来了很大的安全风险。我们分析了钢丝绳断裂机理, 对采样进行综合研究认为: 钢丝绳断裂的直接原因是在用钢丝绳在断裂前的脆性断丝数远远超过标准规定的报废要求, 即该绳“带病工作”, 承载力严重降低, 在过大的解卡载荷下, 剩余钢丝不足以承受工作载荷, 而导致断裂。笔者建议在今后的修井作业过程中, 定期对钢丝绳和轮槽进行检查, 及时更换不满足使用要求的钢丝绳、轮槽; 钢丝绳使用过程中采用合理的润滑方法进行维护; 在钢丝绳保存和转运期间, 避免对钢丝绳造成损伤影响使用寿命; 对于轮式修井机改用钢芯钢丝绳, 避免结构破坏; 鉴于卷筒旋向, 今后应改用右捻钢丝绳。在修井作业过程中, 解卡作业严禁超负荷施工。

Abstract: The fracture breakages failure of wire rope in workover rig may cause a serious riskdanager to personal safety and equipments. The fractural mechanism of wire ropes, and by the comprehensive sampling research, it was concluded that the direct cause of wire fracture breakage was that the quantity of ropebrittleness friable broken wires of rope before breakage was far more than the standard scrapped wire quantity required to be scrapped inunder the standardrequirements, namely the wire rope “is still running under an abnormal state,” and the bearing capacity had greatly decreased greatly, and the remaining normal wires were not capable of bearing the excessive load, resulting in fracturebreakages.It was proposed that it was necessary to regularly inspect wire ropes and sheaves regularly in the future workover processing, and timely replace the unqualified out of standard wire ropes and sheaves; the steel wire rope should be maintained by a reasonable lubrication method in the using process, with a reasonable lubrication method, and operators shallit is necessary to avoid any damage to steel rope that occurs during the storing and transferring process, thus not to shortening its service life; the wheeled type workover rig should be refitted with steel cored wire rope to avoid its structural damage; it is recommended to adopt the right hand lay wire ropes in the future working in consideration of the rotation direction of winding drum. The overload running should be strictly prohibited in jam release of the workover process.

参考文献/REFERENCES

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[导航/NAVIGATE](#)

[本期目录/Table of Contents](#)

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