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# Cabos de Alta Tensão do Tipo OF (Oil Filled) Determinação dos Tempos de Espera

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**Resumo** - Esta pesquisa tem por objetivo o estudo dos cabos de alta tensão do tipo OF (tensão nominal de 138kV e 345kV), na situação de desenergização ou desconexão da fonte de tensão, de forma a subsidiar o estabelecimento de eventuais novos tempos de espera para o aterramento do cabo e equipamentos associados, tendo em vista o aspecto de segurança das equipes de manutenção e operação envolvidas e as demais instalações associadas. Os trabalhos direcionaram-se no sentido de avaliar de forma quantitativa a carga elétrica residual, e para tanto foram desenvolvidos meios para a medição do tempo de descarga de forma a não interferir na constante de tempo do circuito considerado, utilizando-se para tal finalidade um divisor de tensão capacitivo adaptado para medições em corrente contínua. Adicionalmente, foram realizados estudos de modelagem e simulações computacionais envolvendo as instalações objetos do estudo, com a utilização do programa ATP - Alternative Transients Program, de forma a se incrementar o domínio técnico e teórico sobre os fenômenos envolvidos e possibilitar análises mais elaboradas sobre o resultados das medições.

**Palavras-chave** - aterramento, cabos oil filled, cabos de potência subterrâneos.



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## 6 - PAM - Protection, Automation and Monitoring 334 - High Voltage OF (OIL FILLED) Cables - Determination of the Safe Time for Grounding

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Abstract:

The aim of this work is to study the discharging behavior of transmission class (88, 138kV, 230kV and 345kV) Oil Filled AC Cables (OF cables), after disconnection from power source, considering various circuit configurations, in order to assess the minimum period of time for grounding and connecting the circuit to the substation grounding grid in safe conditions, for maintenance purposes. This research is being carried considering the electrical modeling of cable installations, and measurements at the field. For measuring the discharging time, considered as an almost high voltage direct current measurement, special measures were taken in order to not to change the circuit / s time constant, by using a HV capacitive voltage divider adapted for DC measurements. Considering the normal procedures of cable operation, situations are present in which no load, or no other equipment, are directly connected to the cable during disconnection. In this situation, it is important to assess the discharging time of the residual electrostatic remaining charge in the OF cable, considering the safety of the people and equipment involved in maintenance and operation of the cable, and as a second reason, considering that assessing the real discharging time may improve the availability of the underground transmission line by optimizing the time spent for the maintenance procedures, and consequently, improving the utility / s power quality indices.

Considering the results obtained until now, the measurements, the electrical modeling and the computer simulation indicate that the period of time for grounding the equipment, put into practice at present, should be safely reduced.