

# Power System Protection Videos

Bill Anderson

These Videos are copies of a set of classic lectures on video tape. The workbook referenced seems to no longer be available. They are intended for plant designers and maintenance personnel so they contain significant practical details.

<p>lecture(1): elements of system protection Introduction/overview of the need for System Protection and the characteristics of sensors/interrupters used for this protection.</p>	<p><a href="https://www.youtube.com/watch?v=uiZgjY71e0">https://www.youtube.com/watch?v=uiZgjY71e0</a></p>
<p>lecture(2): fault characteristics Characteristics of various faults in Power systems, a review of Power System fault analysis, system grounding, and ferro-resonance. It also introduces dealing with asymmetric faults by modelling them as the sum of three distinct symmetric systems.</p>	<p><a href="https://www.youtube.com/watch?v=3HYHWCTcqEo">https://www.youtube.com/watch?v=3HYHWCTcqEo</a></p>
<p>lecture(3): fault investigation and analysis* An overview of the need for continuous recording and analysis of the performance of protection systems.</p>	<p><a href="https://www.youtube.com/watch?v=iWpUjuyNEBo">https://www.youtube.com/watch?v=iWpUjuyNEBo</a></p>
<p>lecture(4): preliminary verification of installation* An overview of the need and process for testing/commissioning protective equipment.</p>	<p><a href="https://www.youtube.com/watch?v=Pmawf5GfSmc">https://www.youtube.com/watch?v=Pmawf5GfSmc</a></p>
<p>lecture(5): line protection Protection of transmission lines. Different approaches for different classes of lines/grounding system/redundancy and zone of protection.</p>	<p><a href="https://www.youtube.com/watch?v=jHH4o_tl1Rs">https://www.youtube.com/watch?v=jHH4o_tl1Rs</a></p>
<p>lecture(6): pilot wire differential protection Metallic, Power line carrier (PLC), Microwave/Telephone</p>	<p><a href="https://www.youtube.com/watch?v=5UiN58Ts49Y">https://www.youtube.com/watch?v=5UiN58Ts49Y</a></p>
<p>lecture(7): power line carrier More detail and design/application information and digital/analog communication techniques</p>	<p><a href="https://www.youtube.com/watch?v=Ufu38_ic23c">https://www.youtube.com/watch?v=Ufu38_ic23c</a></p>
<p>lecture(8): protection for system stability Stability/Instability, Power flow, Dynamic instability, Practical Considerations.</p>	<p><a href="https://www.youtube.com/watch?v=3Mwy07lLZnE">https://www.youtube.com/watch?v=3Mwy07lLZnE</a></p>
<p>lecture(9): bus protection Bus configurations, a more complex protection problem</p>	<p><a href="https://www.youtube.com/watch?v=vpEDE2aJYTc">https://www.youtube.com/watch?v=vpEDE2aJYTc</a></p>
<p>lecture(10): monitoring system conditions Instrumentation (CT &amp; VT), 3-Phase Transformers, per unit (PU) representation advantages</p>	<p><a href="https://www.youtube.com/watch?v=X0qRaZTV82Q">https://www.youtube.com/watch?v=X0qRaZTV82Q</a></p>
<p>lecture(11): transformer protection Thermal failure protection, protecting various Y and Delta configurations, Reactor protection</p>	<p><a href="https://www.youtube.com/watch?v=duyC2OFie5E">https://www.youtube.com/watch?v=duyC2OFie5E</a></p>
<p>lecture(12): generator protection Prime mover/physical problems, phase to phase/ground winding failure, 3<sup>rd</sup> harmonic currents, backup protection, flashover, frequency monitoring, loss of excitation, ground fault detection.</p>	<p><a href="https://www.youtube.com/watch?v=KEsyo04LekE">https://www.youtube.com/watch?v=KEsyo04LekE</a></p>
<p>lecture(13): motor protection Induction motor review, protection from insulation failure overheating, under voltage and rapid restart. Synchronous motor review &amp; protection (similar to a generator).</p>	<p><a href="https://www.youtube.com/watch?v=8_3RyunbLKI">https://www.youtube.com/watch?v=8_3RyunbLKI</a></p>
<p>lecture(14): testing techniques Instrument accuracy, RMS vs average meters, EMC, source/meter impedance, clamp-on current meter, shunts and Hall effect; Frequency measurement, decibels, terminations, timers, phase, capacitance, ground isolation, scopes, 3-phase, safety measures.</p>	<p><a href="https://www.youtube.com/watch?v=cIIS6WhuuEw">https://www.youtube.com/watch?v=cIIS6WhuuEw</a></p>

\* Not covered in our course – Application content