

HW 3 (due Mon 9/24)  
EE 553, Fall 2012, Dr. McCalley

1. Text Problem 11.1
2. Text Problem 11.2
3. Text Problem 11.3
4. The loading on circuit  $\ell$  is  $f_\ell^0$ . It is known that the flow on circuit  $\ell$  is limited by outage of circuit  $k$  under a stress condition defined by  $\Delta P_i$  (e.g., a generation shift between buses  $i$  and  $j$ , or an increase in load at bus  $j$  compensated by an increase in generation at bus  $i$ ). Determine the SOL for circuit  $\ell$  expressed as a function of  $f_\ell^0$ ,  $f_\ell^{\max}$ , GSFs, and LODFs.

Hint 1: The SOL for circuit  $\ell$  occurs under the condition that

$$f_\ell^0 + \Delta f_\ell = f_\ell^{\max}$$

where  $f_\ell^{\max}$  is the emergency overload rating for circuit  $\ell$ .

Hint 2: There are two network changes that determine  $\Delta f_\ell$ .

Hint 3: The stress condition affects both the flow on circuit  $\ell$  and the flow on circuit  $k$ .