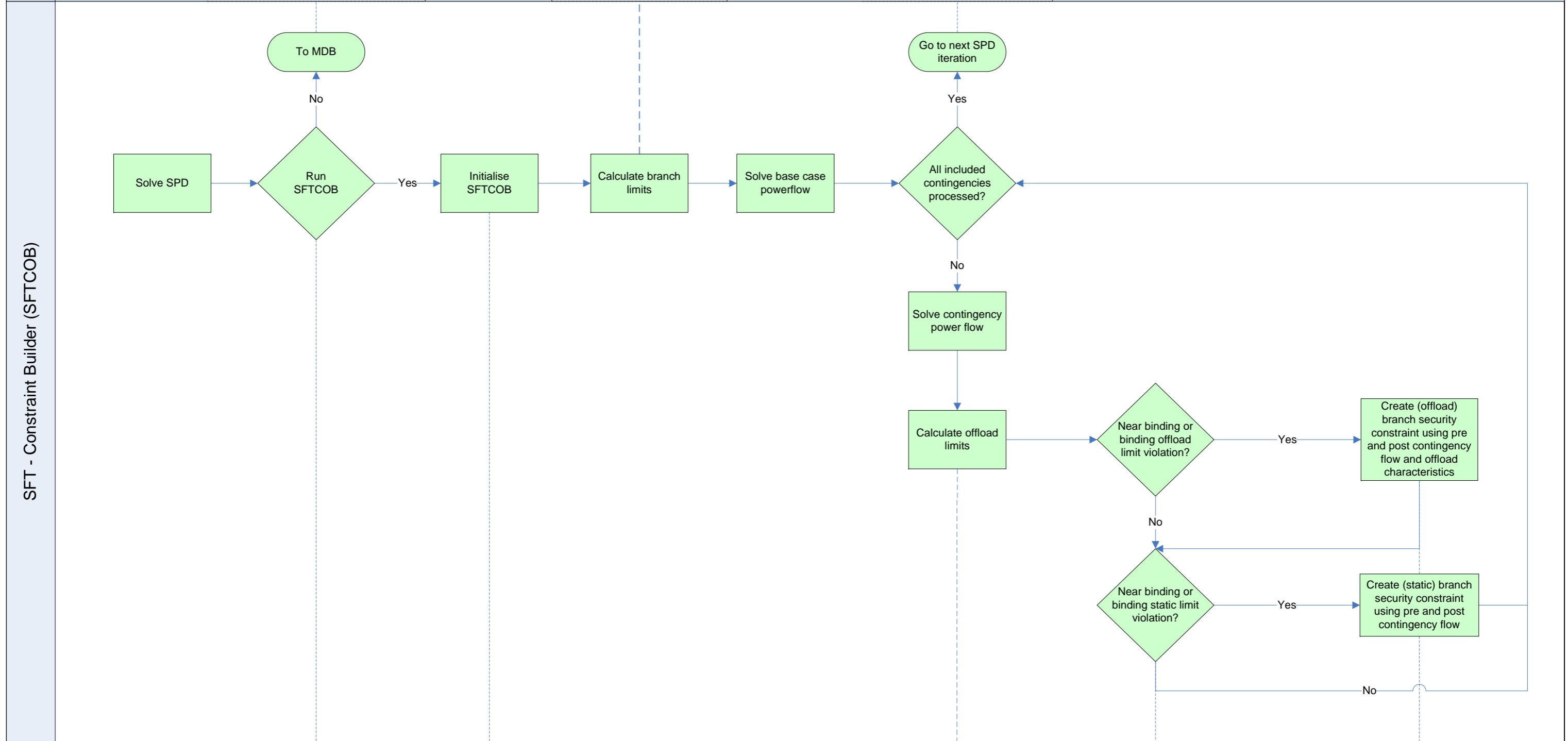


High Level Description of Security Constraint Creation Process with SFT Constraint Builder (SFTCOB) (see page 2 for additional detail)

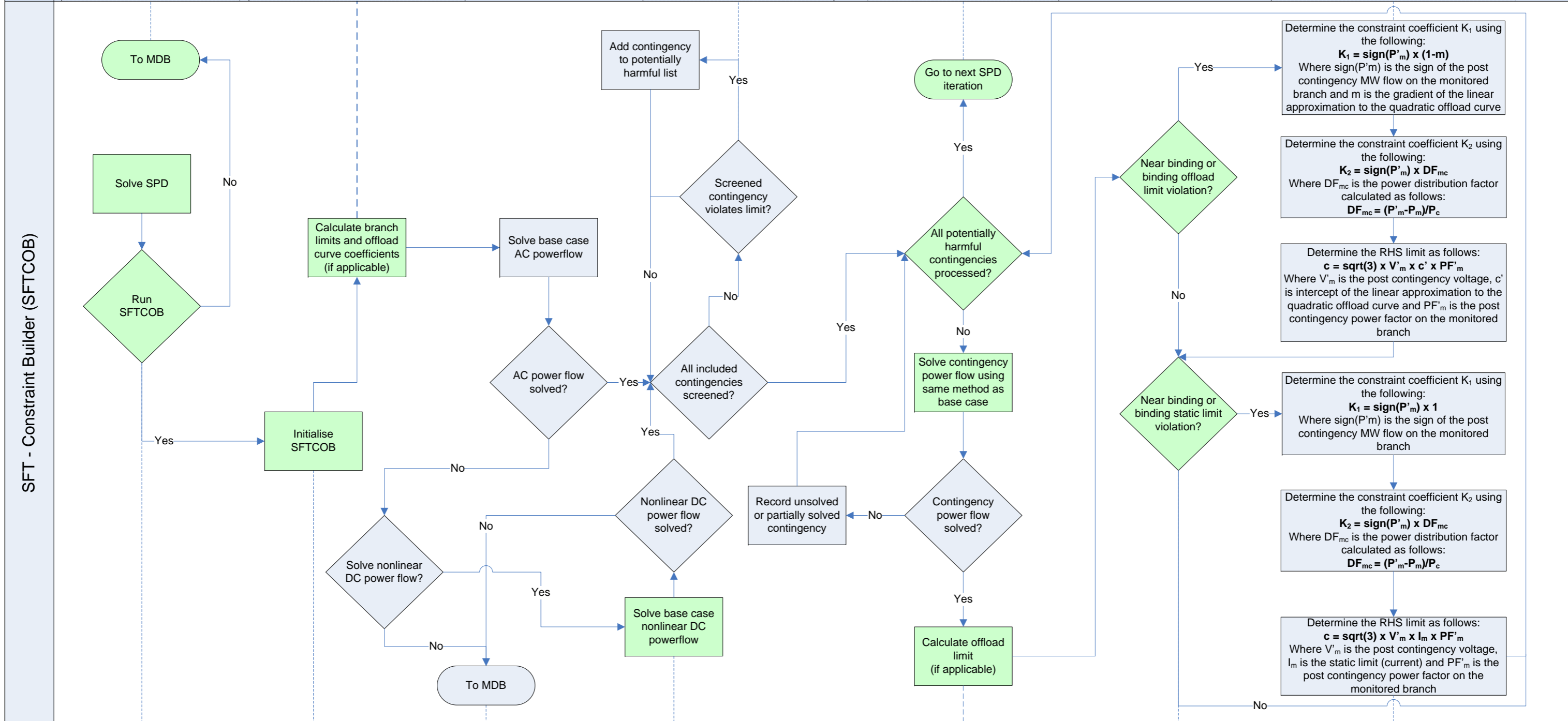
Additional Information		<ul style="list-style-type: none"> Workflow module in the MDB determines the next application to run in the schedule. All constraints used by SPD displayed in the Market Operator Interface (MOI). Branch security constraints within 85% of their limit are published to the market (Production schedules only). 	<ul style="list-style-type: none"> Calculate static and thermal branch limits. Thermal branch limit calculation based on Latta calculation. 	<ul style="list-style-type: none"> Produce constraint file that is to be used in the next SPD iteration for the same trading period. Go to the next SPD iteration for the same trading period. 	
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Additional Information	<ul style="list-style-type: none"> Yes if: SFTCOB enabled for the schedule AND Convergence criteria not satisfied AND Maximum iterations between SPD and SFTCOB not reached 	<ul style="list-style-type: none"> Injection MW from SPD. Network model (offered grid as used by SPD), reactive profile from network database. Contingencies from contingency database. 	<ul style="list-style-type: none"> Offload limits are calculated based on the pre-contingency loading, conductor characteristics and the specified offload time. 	<ul style="list-style-type: none"> Binding violations are violations of 100% of the limit. Near binding violations are violations of X% of the limit. The threshold value (X) is specified in the database. 	<ul style="list-style-type: none"> Constraint of the generic form: $K_1 P_m + K_2 P_c \leq c$ Where K_1 and K_2 are constraint coefficients; P_m and P_c are the pre-contingency power flow on the monitored and contingent branches respectively; c is the RHS of the constraint.
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Detailed Description of Security Constraint Creation Process with SFT Constraint Builder (SFTCOB)

Additional Information	<ul style="list-style-type: none"> Workflow module in the MDB determines the next application to run in the schedule. All constraints used by SPD are displayed in the Market Operator Interface (MOI). Branch security constraints within 85% of their limit are published to the market (Production schedules only). 	<ul style="list-style-type: none"> Calculate static and thermal branch limits. Thermal branch limit calculation based on Latta calculation. Overall base case branch limit is the minimum of the static and thermal limits. If applicable, quadratic offload curve coefficients calculated using specified offload time and conductor characteristics. 	<ul style="list-style-type: none"> Screening based on single iteration of decoupled power flow. Angle difference across the branch is compared to an angle difference limit. Angle difference limit based on active base case branch limit adjusted with a screening tolerance. 	<ul style="list-style-type: none"> Produce MSSENS file that contains created constraints to be used in the next SPD iteration, report unsolved or partially solved contingencies and voltage violations. Indication of AC or DC solve. Go to the next SPD iteration for the same trading period. 	<ul style="list-style-type: none"> Constraint of the generic form: $K_1 P_m + K_2 P_c \leq c$ $K_1 \text{ and } K_2 \text{ are constraint coefficients;}$ $P_m \text{ and } P_c \text{ are the pre-contingency power flow on the monitored and contingent branches respectively;}$ $c \text{ is the RHS of the constraint}$
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Additional Information	<ul style="list-style-type: none"> Yes if SFTCOB enabled for the schedule AND Convergence criteria not satisfied AND Maximum iterations between SPD and SFTCOB not reached Else NO 	<ul style="list-style-type: none"> Injection MW from SPD. Network model (offered grid as used by SPD), reactive profile from network database. Contingencies from contingency database. 	<ul style="list-style-type: none"> Return failed status for SFTCOB. 	<ul style="list-style-type: none"> Nonlinear DC power flow is based on decoupled power flow algorithm but with the convergence on the MVAR problem relaxed and with no voltage magnitude update. 	<ul style="list-style-type: none"> Offload limits are calculated using the quadratic offload curve and the pre-contingency loading. 	<ul style="list-style-type: none"> Binding violations are violations of 100% of the limit. Near binding violations are violations of X% of the limit. The threshold value (X) is specified in the database. 	<ul style="list-style-type: none"> Constraint of the generic form: $K_1 P_m + K_2 P_c \leq c$ $K_1 \text{ and } K_2 \text{ are constraint coefficients;}$ $P_m \text{ and } P_c \text{ are the pre-contingency power flow on the monitored and contingent branches respectively;}$ $c \text{ is the RHS of the constraint}$
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