How to annotate?

1. To have a contract annotated, you need to consider the contract as a whole, i.e., you need to fully understand what articles mean and how they work.

How to annotate?

2.1. Then for each article, you need to determine whether there is a Power or an Obligation, who is the Creditor, who is the Debtor, what is the Trigger, what is the Antecedent, waht is the Consequent, and what is the Asset.

How to annotate?

2.2. If the before mentioned elements cannot be determined in an article,

that article cannot be covered with Symboleo.

How to annotate?

3. At the end, there should be tables containing the gathered information.

Such auxiliary tables will help you specify the contract later. The set of such

tables is called annotated contract.

Example:

Transactive Energy is presented as an example of annotated contract in following slides.

1.2.1

In case of failure in payment, the Distributed Energy Resource Provider (DERP) should pay the invoice in 30 days after California ISO (CAISO) gives the written notice in order for termination to get revoked, otherwise the termination comes true.

Obligation	$O_{PayOverdueInvoice}$
Debtor	DERP
Creditor	CAISO
Trigger	Issuance a written notice (Overdue Invoice)
Antecedent	TRUE
Consequent	Payment is made in 30 days
Asset	Money

2.1.3

Payments for each trading day shall be made four (4) business days after issuance of the invoice and shall be in United States Dollars and cents.

Obligation	O_{PayByISO}
Debtor	CAISO
Creditor	DERP
Trigger	Issuance an invoice AND the payer is CAISO
Antecedent	TRUE
Consequent	Payment is made in 4 business days
Asset	Money

Obligation	O_{PayBySupplier}
Debtor	DERP
Creditor	CAISO
Trigger	Issuance an invoice AND the payer is DERP
Antecedent	TRUE
Consequent	Payment is made in 4 business days
Asset	Money

2.1.4

As soon as a Bid comes into effect, DERP shall supply and deliver energy according to the terms in the Bid and also in the Dispatch Instruction.

Obligation	$O_{SupplyEenergy}$
Debtor	DERP
Creditor	CAISO
Trigger	Bid is accepted
Antecedent	TRUE
Consequent	Energy supplied as per the Bid
Asset	Energy

Two articles:

2.1.5 CAISO must isuue an invoice upon each Bid which comes into effect in three days after the Bid's date.

3.1 If DERP fails to comply with its energy supply commitment, CAISO shall be entitled to impose penalties and sanctions on DERP. The penalty shall be calculated as 50% of the associated Bid Price. The penalty shall appear in an invoice.

Obligation	$O_{IssueDebitInvoice}$
Debtor	CAISO
Creditor	DERP
Trigger	Violation of $O_{SupplyEnergy}$
Antecedent	TRUE
Consequent	Debited Invoice is issued in 3 days
Asset	Invoice

Obligation	$O_{IssueCreditInvoice}$
Debtor	CAISO
Creditor	DERP
Trigger	Fulfillment of $O_{supplyEnergy}$
Antecedent	TRUE
Consequent	Credited Invoice is issued in 3 days
Asset	Invoice

2.1.1

A Bid may be submitted no sooner than seven days prior to the Trading Day and no later than 10:00 am on the day preceding the Trading Day. The information of a Bid must include Resource Location or Resource ID as appropriate, the CAISO Market to which the Bid applies, Trading Day to which the Bid applies, Energy Quantity, and Bid Price.

Power	$P_{SubmitBid}$
Debtor	CAISO
Creditor	DERP
Trigger	Bid is prepared
Antecedent	TRUE
Consequent	Bid is submitted in the mentioned time
Asset	Bid

2.1.2

The CAISO may accept a submitted Bid.

Power	P_{AcceptBid}
Debtor	DERP
Creditor	CAISO
Trigger	Bid is submitted
Antecedent	TRUE
Consequent	Bid is accepted
Asset	Bid

1.2.1

The CAISO may terminate this Agreement by giving a written notice of termination in the event that the DERP fails to pay an invoice, issued under section 3.1 of this Agreement, by the due date or to provide energy according to the Dispatch Instruction.

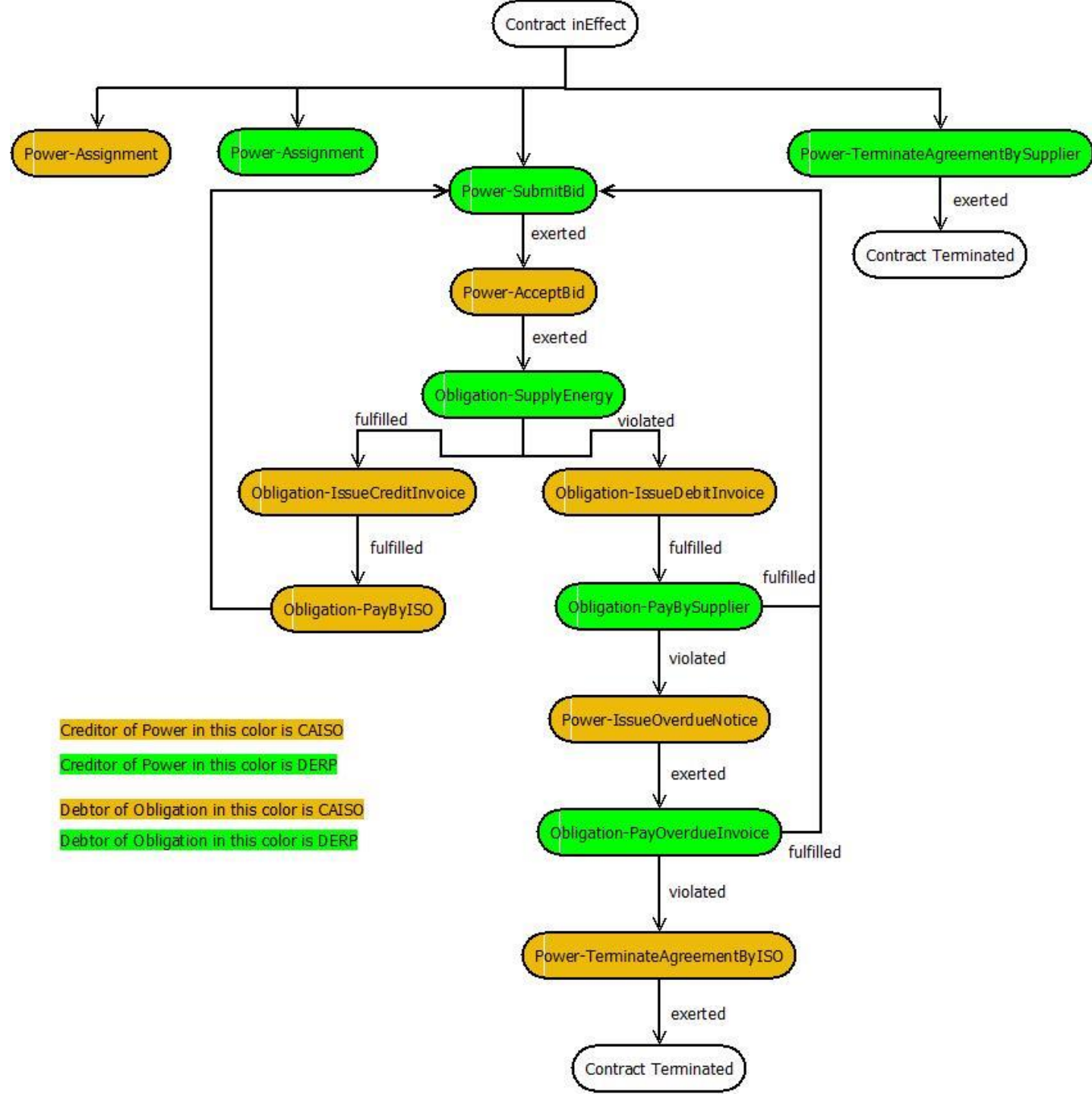| Power	$P_{IssueOverdueNotice}$
Debtor	DERP
Creditor	CAISO
Trigger	Violation of $O_{PayBySupplier}$
Antecedent	TRUE
Consequent	Overdue invoice (written notice of termination) is issued
Asset	Invoice

Power	$P_{TerminateAgreementByISO}$
Debtor	DERP
Creditor	CAISO
Trigger	Violation of $O_{PayOverdueInvoice}$
Antecedent	TRUE
Consequent	The Agreement is terminated
Asset	Agreement

1.2.2

In the event that the DERP no longer wishes to submit Bids or transmit energy over the CAISO-controlled Grid, it may terminate this Agreement, on giving the CAISO not less than ninety (90) days a written notice.

Power	P$_{TerminateAgreementBySupplier}$
Debtor	CAISO
Creditor	DERP
Trigger	TRUE
Antecedent	Written termination notice is issued
Consequent	The Agreement is terminated in 90 days
Asset	Agreement

TE Contract at a glance:

Contract inEffect

Power-Assignment   Power-Assignment   Power-SubmitBid   Power-TerminateAgreementBySupplier

Power-SubmitBid → exerted → Power-AcceptBid → exerted → Obligation-SupplyEnergy

Obligation-SupplyEnergy:
- fulfilled → Obligation-IssueCreditInvoice → fulfilled → Obligation-PayByISO
- violated → Obligation-IssueDebitInvoice → fulfilled → Obligation-PayBySupplier

Power-TerminateAgreementBySupplier → exerted → Contract Terminated

Obligation-PayBySupplier:
- fulfilled → Power-SubmitBid
- violated → Power-IssueOverdueNotice → exerted → Obligation-PayOverdueInvoice
  - fulfilled → Power-SubmitBid
  - violated → Power-TerminateAgreementByISO → exerted → Contract Terminated

Creditor of Power in this color is CAISO

Creditor of Power in this color is DERP

Debtor of Obligation in this color is CAISO

Debtor of Obligation in this color is DERP

More Information?

To get more information on the specified contract or to see the text of TE

Contract, refer to my Bachelor-Thesis.