(1) Proper occurrent part of has domain occurrent and range occurrent
\[ \forall a,b (\text{properOccurrentPartOf}(a,b) \rightarrow \exists t \text{instanceOf}(a,\text{occurrent},t) \land \exists t \text{instanceOf}(b,\text{occurrent},t)) \]

(2) Participates in is time indexed and has domain: independent continuant but not spatial region or specifically dependent continuant or generically dependent continuant and range: process
\[ \forall a,b,t (\text{participatesIn}(a,b,t) \rightarrow (\text{instanceOf}(a,\text{independentContinuant},t) \land \neg \text{instanceOf}(a,\text{spatialRegion},t)) \lor \text{instanceOf}(a,\text{specificallyDependentContinuant},t) \lor \text{instanceOf}(a,\text{genericallyDependentContinuant},t) \land \text{instanceOf}(b,\text{process},t) \land \text{instanceOf}(t,\text{temporalRegion},t)) \]

(3) Occurs in has domain process or process boundary and range material entity or site
\[ \forall a,b \text{ occursIn}(a,b) \rightarrow (\exists t (\text{instanceOf}(a,\text{process},t) \lor \text{instanceOf}(a,\text{processBoundary},t))) \land (\exists t (\text{instanceOf}(b,\text{materialEntity},t) \lor \text{instanceOf}(b,\text{site},t))) \]

(4) Concretizes is time indexed and has domain: specifically dependent continuant or process and range: generically dependent continuant
\[ \forall a,b,t \text{ concretizes}(a,b,t) \rightarrow (\text{instanceOf}(a,\text{specificallyDependentContinuant},t) \lor \text{instanceOf}(a,\text{process},t)) \land \text{instanceOf}(b,\text{genericallyDependentContinuant},t) \land \text{instanceOf}(t,\text{temporalRegion},t)) \]

(5) Inheres in has domain specifically dependent continuant and range independent continuant but not spatial region
\[ \forall a,b \text{ inheresIn}(a,b) \rightarrow \exists t \text{instanceOf}(a,\text{specificallyDependentContinuant},t) \land (\exists t (\text{instanceOf}(b,\text{independentContinuant},t) \land \neg \text{instanceOf}(b,\text{spatialRegion},t))) \]

(6) Relata of exists at are particulars.
\[ \forall i,t \text{existsAt}(i,t) \rightarrow \text{particular}(i) \land \text{particular}(t) \land \text{instanceOf}(t,\text{temporalRegion},t)) \]

(7) Spatially projects onto is time indexed and has domain: spatiotemporal region and range: spatial region
\[ \forall a,b,t \text{ spatiallyProjectsOnto}(a,b,t) \rightarrow \text{instanceOf}(a,\text{spatiotemporalRegion},t) \land \text{instanceOf}(b,\text{spatialRegion},t) \land \text{instanceOf}(t,\text{temporalRegion},t)) \]

(8) Continuant part of is time indexed and has domain: continuant and range: continuant
\[ \forall a,b,t \text{ continuantPartOf}(a,b,t) \rightarrow \text{instanceOf}(a,\text{continuant},t) \land \text{instanceOf}(b,\text{continuant},t) \land \text{instanceOf}(t,\text{temporalRegion},t)) \]

(9) Member part of is time indexed and has domain: object and range: object aggregate
\[ \forall a,b,t \text{ memberPartOf}(a,b,t) \rightarrow \text{instanceOf}(a,\text{object},t) \land \text{instanceOf}(b,\text{objectAggregate},t) \land \text{instanceOf}(t,\text{temporalRegion},t)) \]

(10) Specifically depends on has domain specifically dependent continuant and range specifically dependent continuant or independent continuant but not spatial region
\[ \forall a,b \text{ specificallyDependsOn}(a,b) \rightarrow \exists t \text{instanceOf}(a,\text{specificallyDependentContinuant},t) \land (\exists t (\text{instanceOf}(b,\text{specificallyDependentContinuant},t) \lor \text{instanceOf}(b,\text{independentContinuant},t) \land \neg \text{instanceOf}(b,\text{spatialRegion},t))) \]

(11) Has material basis is time indexed and has domain: disposition and range: material entity
\[ \forall a,b,t \text{ hasMaterialBasis}(a,b,t) \rightarrow \text{instanceOf}(a,\text{disposition},t) \land \text{instanceOf}(b,\text{materialEntity},t) \land \text{instanceOf}(t,\text{temporalRegion},t)) \]

(12) Proper continuant part of is time indexed and has domain: continuant and range: continuant
∀ a, b, t (properContinuantPartOf(a, b, t) → instanceOf(a, continuant, t) ∧ instanceOf(b, continuant, t) ∧ instanceOf(t, temporalRegion, t))

(13) Realizes has domain process and range realizable entity
∀ a, b (realizes(a, b) → ∃ t instanceOf(a, process, t) ∧ ∃ t instanceOf(b, realizableEntity, t))

(14) Temporal part of has domain occurrent and range occurrent
∀ a, b (temporalPartOf(a, b) → ∃ t instanceOf(a, occurrent, t) ∧ ∃ t instanceOf(b, occurrent, t))

(15) Occupies spatial region is time indexed and has domain: independent continuant but not spatial region and range: spatial region
∀ a, b, t (occupiesSpatialRegion(a, b, t) → instanceOf(a, independentContinuant, t) ∧ ¬instanceOf(a, spatialRegion, t) ∧ instanceOf(b, spatialRegion, t) ∧ instanceOf(t, temporalRegion, t))

(16) Occupies temporal region has domain process or process boundary and range temporal region
∀ a, b (occupiesTemporalRegion(a, b) → (∃ t (instanceOf(a, process, t) ∨ instanceOf(a, processBoundary, t))) ∧ ∃ t instanceOf(b, temporalRegion, t))

(17) Has last instant has domain temporal region and range temporal instant
∀ a, b (hasLastInstant(a, b) → ∃ t instanceOf(a, temporalRegion, t) ∧ ∃ t instanceOf(b, temporalInstant, t))

(18) Occupies spatiotemporal region has domain process or process boundary and range spatiotemporal region
∀ a, b (occupiesSpatiotemporalRegion(a, b) → (∃ t (instanceOf(a, process, t) ∨ instanceOf(a, processBoundary, t))) ∧ ∃ t instanceOf(b, spatiotemporalRegion, t))

(19) Precedes has domain occurrent and range occurrent
∀ a, b (precedes(a, b) → ∃ t instanceOf(a, occurrent, t) ∧ ∃ t instanceOf(b, occurrent, t))

(20) Occurrent part of has domain occurrent and range occurrent
∀ a, b (occurrentPartOf(a, b) → ∃ t instanceOf(a, occurrent, t) ∧ ∃ t instanceOf(b, occurrent, t))

(21) Temporally projects onto has domain spatiotemporal region and range temporal region
∀ a, b (temporallyProjectsOnto(a, b) → ∃ t instanceOf(a, spatiotemporalRegion, t) ∧ ∃ t instanceOf(b, temporalRegion, t))

(22) Relata of instance of are particular, universal, temporal region.
∀ i, u, t (instanceOf(i, u, t) → particular(i) ∧ universal(u) ∧ instanceOf(t, temporalRegion, t))

(23) Generically depends on is time indexed and has domain: generically dependent continuant and range: independent continuant but not spatial region
∀ a, b, t (genericallyDependsOn(a, b, t) → instanceOf(a, genericallyDependentContinuant, t) ∧ instanceOf(b, independentContinuant, t) ∧ ¬instanceOf(b, spatialRegion, t) ∧ instanceOf(t, temporalRegion, t))

(24) Located in is time indexed and has domain: independent continuant but not spatial region and range: independent continuant but not spatial region
∀ a, b, t (locatedIn(a, b, t) → instanceOf(a, independentContinuant, t) ∧ ¬instanceOf(a, spatialRegion, t) ∧ instanceOf(b, independentContinuant, t) ∧ ¬instanceOf(b, spatialRegion, t) ∧ instanceOf(t, temporalRegion, t))

(25) History of has domain history and range material entity
∀ a, b (historyOf(a, b) → ∃ t instanceOf(a, history, t) ∧ ∃ t instanceOf(b, materialEntity, t))

(26) Proper temporal part of has domain occurrent and range occurrent
∀ a, b (properTemporalPartOf(a, b) → ∃ t instanceOf(a, occurrent, t) ∧ ∃ t instanceOf(b, occurrent, t))
(27) Has first instant has domain temporal region and range temporal instant
∀a,b (hasFirstInstant(a,b)
→ ∃ t instanceOf(a,temporalRegion,t) ∧ ∃ t instanceOf(b,temporalInstant,t))