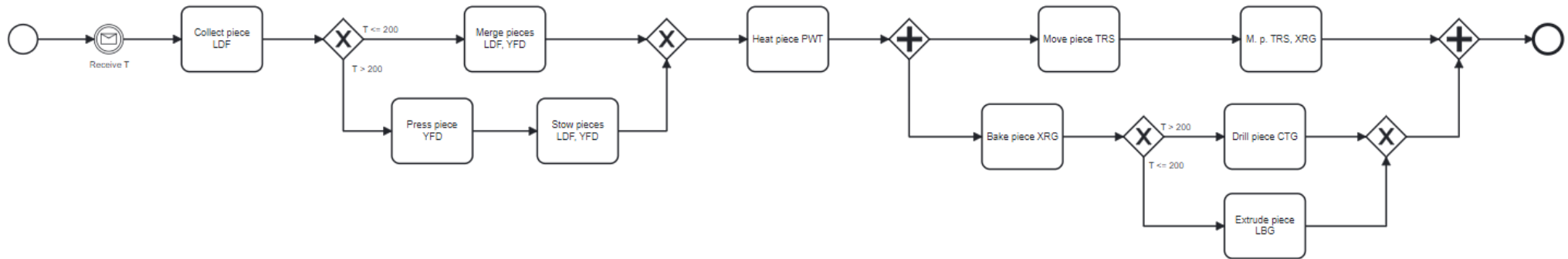


Task ID: Task02lex

Question: How many pieces have to be *moved*?

Ambiguous sub-process model:



Ambiguity: Activity "M. p. TRS, XRG" has a label containing abbreviations. Thus, the activity label meaning is unclear, as it could be interpreted as "Merge pieces" or "Move pieces" (which occur in other activities), hence it is unclear whether to count piece XRG or not in the answer.

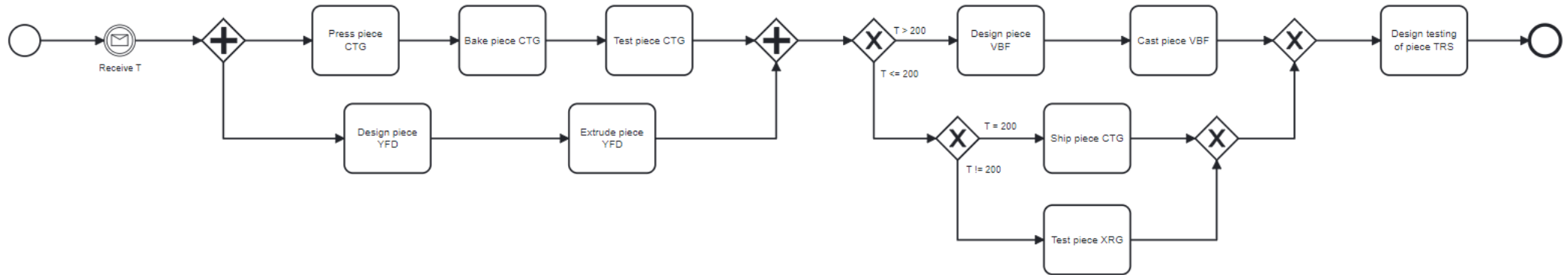
Lexical ambiguity

Violates guidelines: 27, 30 from Corradini, F., Ferrari, A., Fornari, F., Gnesi, S., Polini, A., Re, B., Spagnolo, G.O.: A guidelines framework for understandable bpmn models. *Data & Knowledge Engineering* 113, 129–154 (2018)

Task ID: Task03lex

Question: How many pieces have to be *tested*?

Ambiguous sub-process model:



Ambiguity: Activity "Design testing of piece TRS" has a label that can be read both in the verb-object form (meaning Design the testing of piece TRS) and in the object-verb form (meaning Test the design of piece TRS). Thus, it is unclear how to interpret the activity and whether to count piece TRS in the answer.

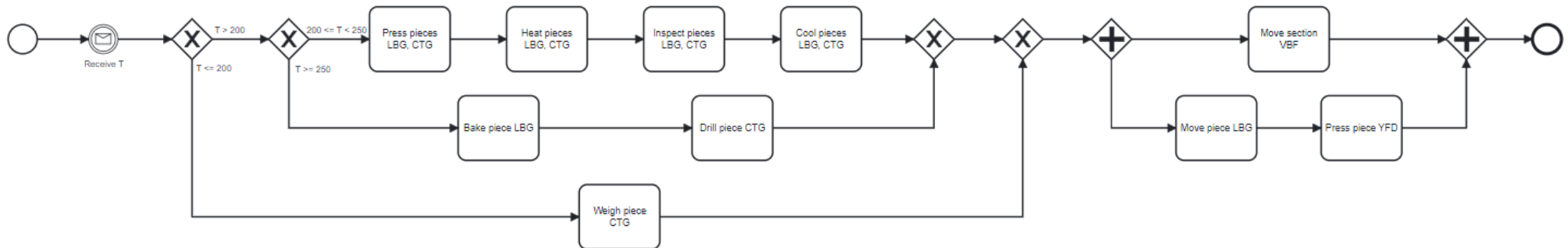
Lexical ambiguity

Violates guidelines: 30 from Corradini, F., Ferrari, A., Fornari, F., Gnesi, S., Polini, A., Re, B., Spagnolo, G.O.: A guidelines framework for understandable bpmn models. *Data & Knowledge Engineering* 113, 129–154 (2018), G6 from Mendling, J., Reijers, H.A., van der Aalst, W.M.: Seven process modeling guidelines (7pmg). *Information and software technology* 52(2), 127–136 (2010)

Task ID: Task04lex

Question: How many pieces have to be *moved*?

Ambiguous sub-process model:



Ambiguity: Activity "Move section VBF" has a label that uses a terminology that is not meaningful for the business process. Thus, it is unclear whether it refers to *moving pieces* like the other activities, or it describes a different activity, and whether piece VBF should be counted in the answer.

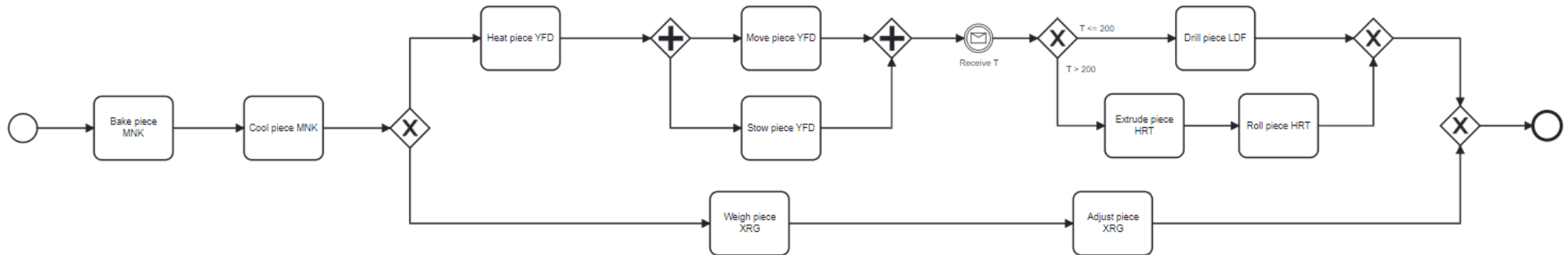
Lexical ambiguity

Violates guidelines: 27, 30 from Corradini, F., Ferrari, A., Fornari, F., Gnesi, S., Polini, A., Re, B., Spagnolo, G.O.: A guidelines framework for understandable bpmn models. *Data & Knowledge Engineering* 113, 129–154 (2018)

Task ID: Task05syn

Question: Name a valid trace in the process, assuming that the temperature $T=200$.

Ambiguous sub-process model:



Ambiguity: The XOR gateway and its outgoing control flow edges have no conditions attached. Thus, the gateway can be interpreted as an underspecified XOR, or as an AND that has been represented with the wrong gateway type.

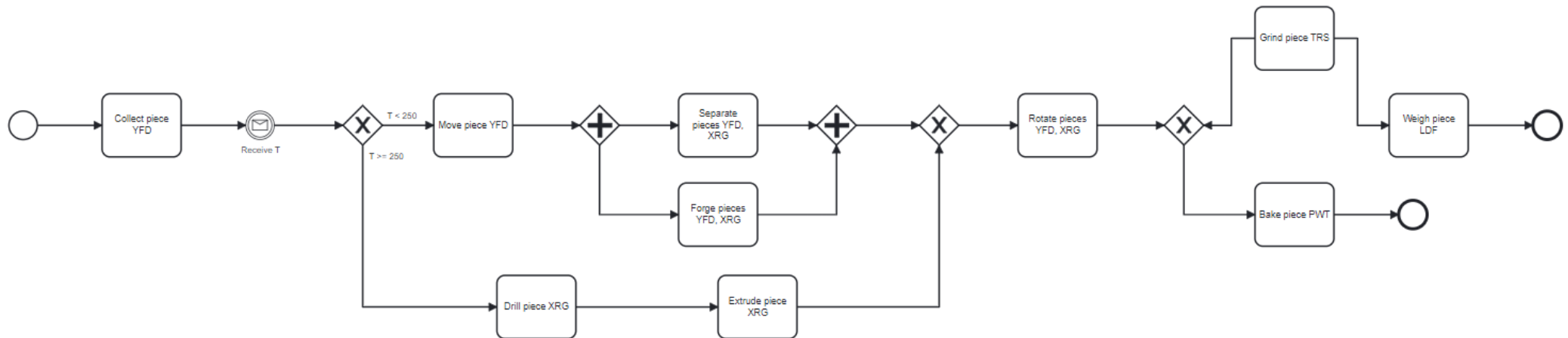
Syntactic ambiguity

Violates guidelines: 34 from Corradini, F., Ferrari, A., Fornari, F., Gnesi, S., Polini, A., Re, B., Spagnolo, G.O.: A guidelines framework for understandable bpmn models. *Data & Knowledge Engineering* 113, 129–154 (2018)

Task ID: Task06syn

Question: Name a valid trace in the process, assuming that the temperature $T=200$.

Ambiguous sub-process model:



Ambiguity: The last XOR gateway has two incoming branches and one outgoing branch as if it were a join; however, there is no prior gateway for a split. It is unclear whether the control flow from activity “Grind piece TRS” is erroneously reversed, or there is an implicit start and XOR split before the activity.

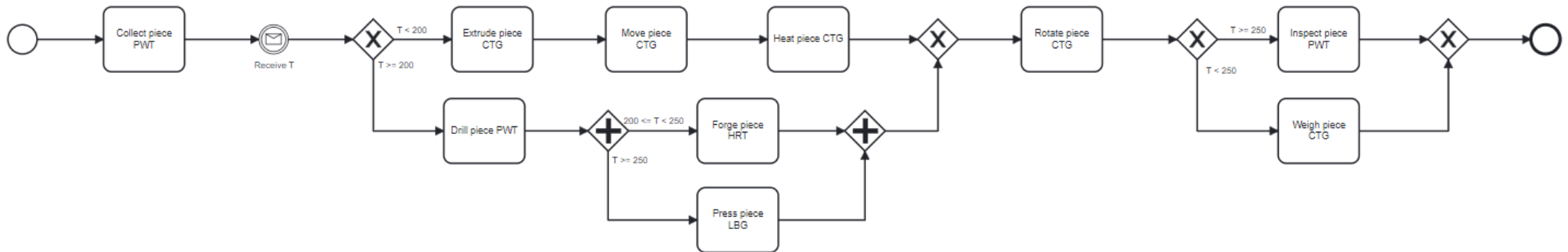
Syntactic ambiguity

Violates guidelines: 4, 16 from Corradini, F., Ferrari, A., Fornari, F., Gnesi, S., Polini, A., Re, B., Spagnolo, G.O.: *A guidelines framework for understandable bpmn models*. *Data & Knowledge Engineering* 113, 129–154 (2018), G4 from Mendling, J., Reijers, H.A., van der Aalst, W.M.: *Seven process modeling guidelines (7pmg)*. *Information and software technology* 52(2), 127–136 (2010)

Task ID: Task07syn

Question: Name a valid trace in the process, assuming that the temperature $T=200$.

Ambiguous sub-process model:



Ambiguity: The parallel gateway has the outgoing control flow edges labeled with conditions; therefore, it is not clear whether the gateway is an AND and the conditions have been assigned to the wrong control flow edges, or the gateway is a XOR but it has been assigned the wrong type.

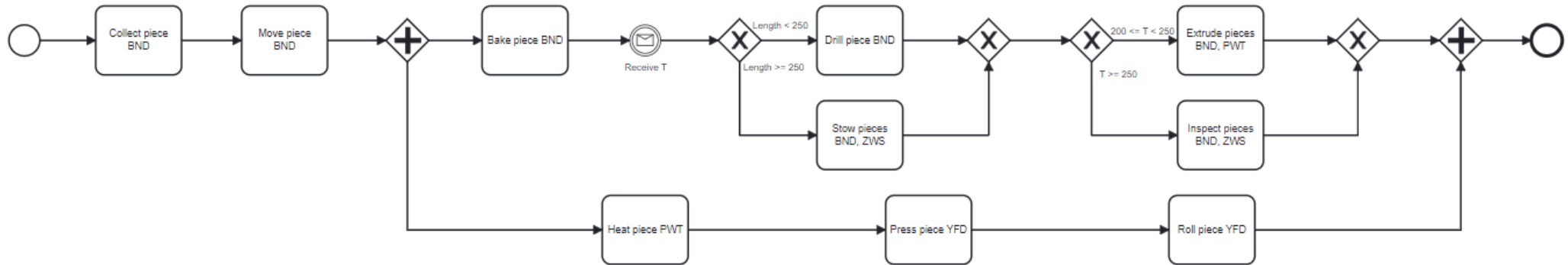
Syntactic ambiguity

Violates guidelines: 35 from Corradini, F., Ferrari, A., Fornari, F., Gnesi, S., Polini, A., Re, B., Spagnolo, G.O.: *A guidelines framework for understandable bpmn models*. *Data & Knowledge Engineering* 113, 129–154 (2018)

Task ID: Task08sem

Question: Name a valid trace in the process, assuming that the temperature $T=200$.

Ambiguous sub-process model:



Ambiguity: The first XOR gateway has two outgoing branches that have conditions based on variable *Length*, which is not specified before; before the split, variable *T* is received. Thus, it is unclear how the control flow should continue at the gateway.

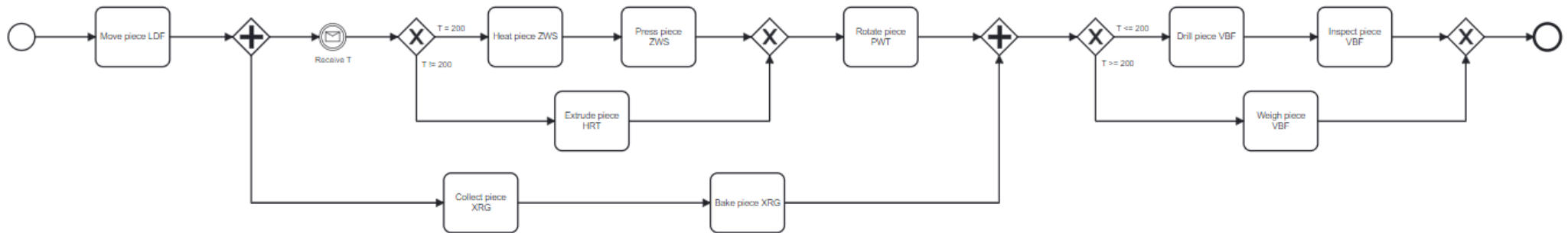
Semantic ambiguity

Violates guidelines: 27, 37 from Corradini, F., Ferrari, A., Fornari, F., Gnesi, S., Polini, A., Re, B., Spagnolo, G.O.: A guidelines framework for understandable bpmn models. *Data & Knowledge Engineering* 113, 129–154 (2018)

Task ID: Task09sem

Question: Name a valid trace in the process, assuming that the temperature $T=200$.

Ambiguous sub-process model:



Ambiguity: The last XOR gateway has two outgoing branches, whose conditions overlap on the edge case ($T=200$); thus, it is unclear which branch is supposed to be followed in the edge case.

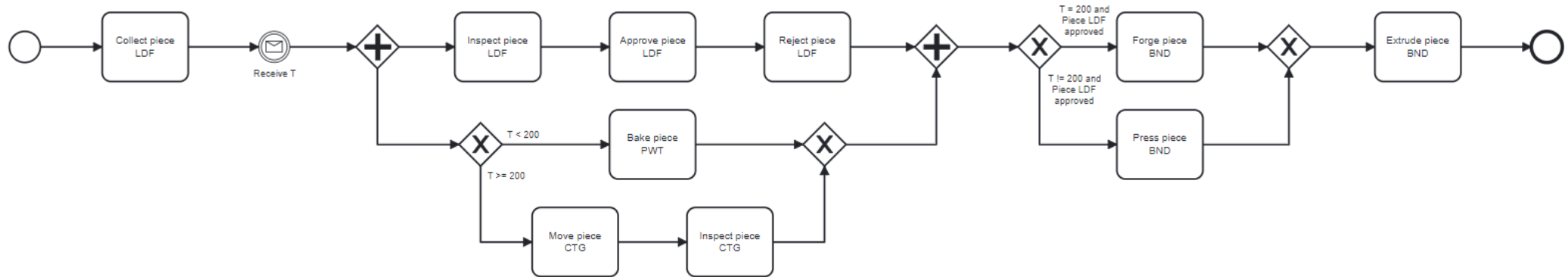
Semantic ambiguity

Violates guidelines: 21 from Corradini, F., Ferrari, A., Fornari, F., Gnesi, S., Polini, A., Re, B., Spagnolo, G.O.: A guidelines framework for understandable bpmn models. *Data & Knowledge Engineering* 113, 129–154 (2018)

Task ID: Task10sem

Question: Name a valid trace in the process, assuming that the temperature $T=200$.

Ambiguous sub-process model:



Ambiguity: In the parallel branch, activity "Approve piece LDF" is followed by activity "Reject piece LDF". The subsequent XOR-split conditions refer to piece LDF being approved, hence it is unclear how the control flow should continue.

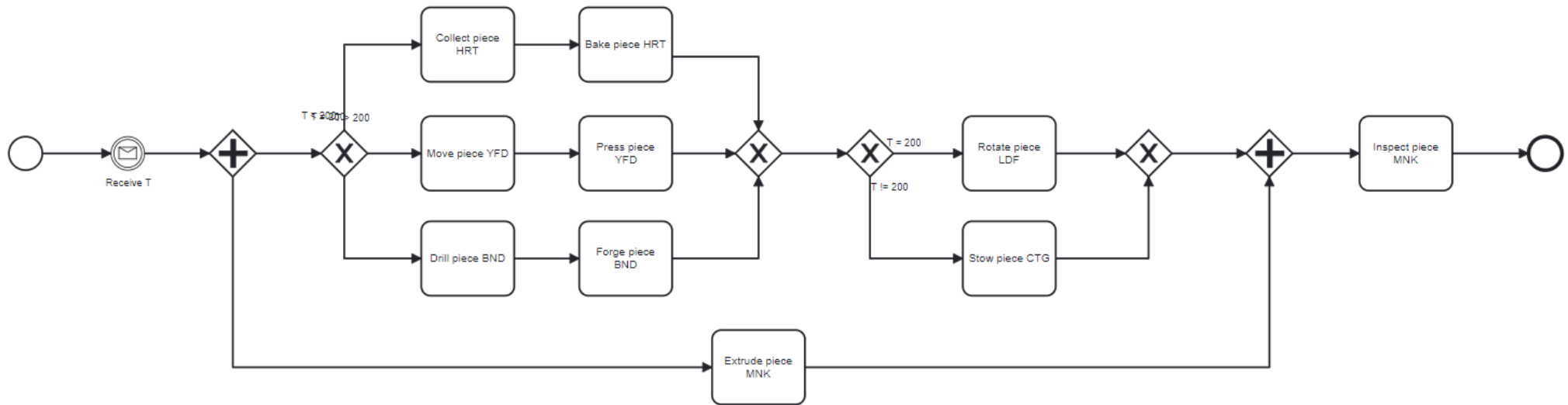
Semantic ambiguity

Violates guidelines: 5, 8, 20, 34 from Corradini, F., Ferrari, A., Fornari, F., Gnesi, S., Polini, A., Re, B., Spagnolo, G.O.: *A guidelines framework for understandable bpmn models*. *Data & Knowledge Engineering* 113, 129–154 (2018)

Task ID: Task11prag

Question: Name a valid trace in the process, assuming that the temperature $T=200$.

Ambiguous sub-process model:



Ambiguity: The conditions associated with the control flow edges outgoing from the XOR gateway overlap; thus, it is unclear which of the control flow edges should be taken after the gateway for the different cases.

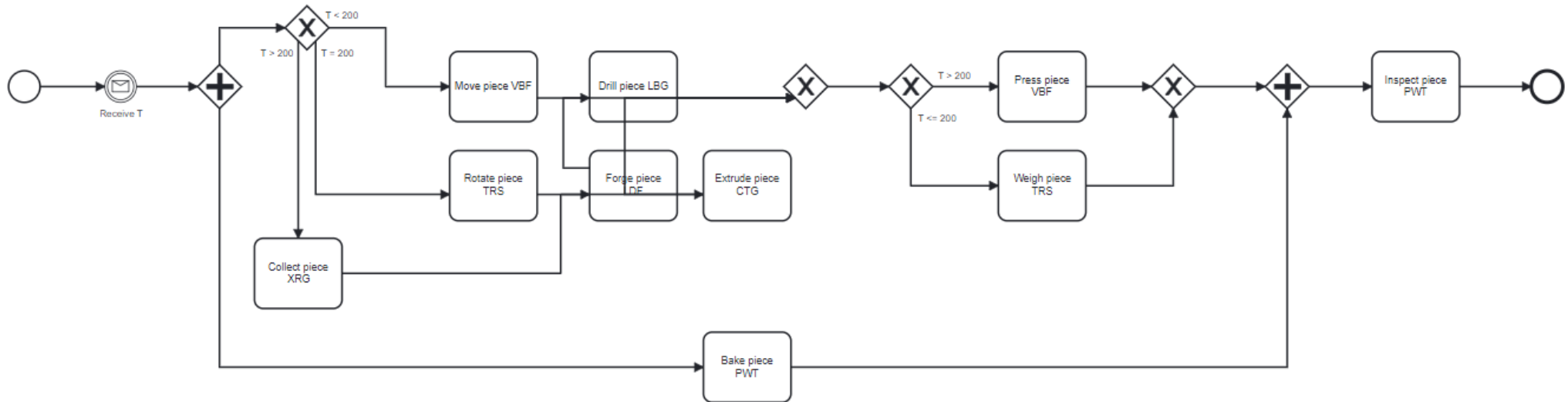
Pragmatic ambiguity

Violates guidelines: 43, 44 from Corradini, F., Ferrari, A., Fornari, F., Gnesi, S., Polini, A., Re, B., Spagnolo, G.O.: A guidelines framework for understandable bpmn models. *Data & Knowledge Engineering* 113, 129–154 (2018)

Task ID: Tas12prag

Question: Name a valid trace in the process, assuming that the temperature $T=200$.

Ambiguous sub-process model:



Ambiguity: The control flow edges after the first task in each outgoing branch of the first XOR gateway overlap and cross each other; thus, it is not clear how the flow continues after the first task in each of these branches.

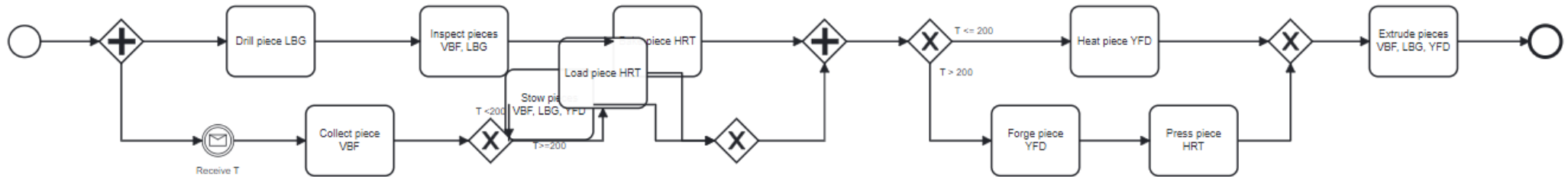
Pragmatic ambiguity

Violates guidelines: 43, 44, 45 from Corradini, F., Ferrari, A., Fornari, F., Gnesi, S., Polini, A., Re, B., Spagnolo, G.O.: A guidelines framework for understandable bpmn models. *Data & Knowledge Engineering* 113, 129–154 (2018)

Task ID: Task13prag

Question: Name a valid trace in the process, assuming that the temperature $T=200$.

Ambiguous sub-process model:



Ambiguity: The activities in the two branches of the AND-split are overlapping and it is unclear how the control flow proceeds.

Pragmatic ambiguity

Violates guidelines: 43, 44, 45, 47 from Corradini, F., Ferrari, A., Fornari, F., Gnesi, S., Polini, A., Re, B., Spagnolo, G.O.: A guidelines framework for understandable bpmn models. *Data & Knowledge Engineering* 113, 129–154 (2018)