Tarski Undefinability Theorem Succinctly Refuted

If the conclusion of the Tarski Undefinability Theorem was that some artificially constrained limited notions of a formal system necessarily have undecidable sentences, then Tarski made no mistake within the his assumptions. When we expand the scope of his conclusion to other notions of formal systems we reach an entirely different conclusion showing that Tarski's assumptions were wrong.

A very slight augmentation to the conventional notion of a formal system refutes the much more narrowly constrained Tarski results. This slightly augmented notion of a formal system is in every way identical to the conventional notion except that it recognizes and rejects semantically incorrect expressions of language.

This refutation applies to the generalized result of the Tarski Undefinability Theorem: **All formal systems of greater expressive power than arithmetic necessarily have undecidable sentences.** and requires that the formal system have its own provability predicate, eliminating the need for diagonalization.

When Closed WFF x of formal system F is considered:

True its a theorem of F: $(F \vdash x)$.
False its negation is a theorem of F: $(F \vdash \sim x)$.
Incorrect its neither True nor False in F.

Truth Predicate Axioms
(Tarski Notation, Conventional Notation and Simple English)
(1) $x \in Tr \leftrightarrow x \in Pr$ // $True(x) \leftrightarrow (\vdash x)$
A set of facts adds up to X being TRUE.

(2) $\sim x \in Tr \leftrightarrow \sim x \in Pr$ // $False(x) \leftrightarrow (\vdash \sim x)$
A set of facts adds up to X being FALSE.

(3) $x \notin Tr \leftrightarrow x \notin Pr$ // $\sim True(x) \leftrightarrow \sim(\vdash x)$
There are no set of facts that add up to X being TRUE.

Anyone truly understanding the Tarski Undefinability proof would know that the whole proof would fail as soon as its third step would be proven false: (3) $x \notin Pr \leftrightarrow x \in Tr$

Applying Truth Predicate Axiom(3) decides that Tarski's step(3) is false:
Swap the LHS of Tarski(3) [$x \notin Pr$] that matches RHS of Axiom(3) [$x \notin Pr$] with the LHS of Axiom(3) and we derive $x \notin Tr \leftrightarrow x \in Tr$, which is clearly false, thus decidable.

By making a very slight change to the conventional notion of a formal system we have a new notion of formal system that is in every way identical to the prior notion except that it correctly decides all of the sentences that were previously undecidable.

The above can only be understood within the context of the Tarski Proof:
http://liarparadox.org/Tarski_Proof_275_276.pdf

The first incompleteness theorem states that in any consistent formal system F within which a certain amount of arithmetic can be carried out, there are statements of the language of F which can neither be proved nor disproved in F. (Raatikainen, Panu, 2018)

The Slight adaptation to the notion of a formal system makes this sentence true:
$\sim\exists F \in \text{Formal\_Systems} \sim\exists G \in \text{WFF}(F)\ (G \leftrightarrow (\sim(F \vdash G) \lor \sim(F \vdash \sim G)))$
Thus proving that no statements of any formal system F fulfill the above paragraph.