```
compose_iter_wf  THM

⊢  ∀f:(A→A), i:ℕ. f{⁰i} ∈ A→A  by UnivCD
|
1. A : Type
2. f : A→A
3. i : ℕ
⊢  f{⁰i} ∈ A→A  by NatInd Hyp:-1
|
|\
| .....basecase .....
| 2. f : A→A
| ⊢  f{⁰0} ∈ A→A  by Compute ⌈f{⁰0}⌉ *⇒ λx.x
|
.\
. .....upcase .....
. 3. i : ℤ
. 4. 0<i
. 5. f{⁰i-1} ∈ A→A
. ⊢  f{⁰i} ∈ A→A
. | by Compute (⌈f{⁰i}⌉ *⇒ λx.if i=₂0→ x else f(f{⁰i-1}(x)) fi) ∈ A→A
. |    THEN
. |    FunExtensionality
. |
. 6. x : A
. ⊢  if i=₂0→ x else f(f{⁰i-1}(x)) fi ∈ A  by SplitITE Concl
. |
. |\
. | .....truecase .....
. | 7. i = 0
. | ⊢  x ∈ A  by Trivial
. |
. .\
. . .....falsecase .....
. . 7. i ≠ 0
. . ⊢  f(f{⁰i-1}(x)) ∈ A  by Analyze
. . |
. . |\
. . | ⊢  f ∈ A→A  by Trivial
. . |
. . .\
. . . ⊢  f{⁰i-1}(x) ∈ A  by Analyze
. . . |
. . . |\
. . . | ⊢  f{⁰i-1} ∈ A→A  by Hypothesis
. . . |
. . . .\
. . . . ⊢  x ∈ A  by Trivial
END
```