Algorithm $\mathtt{gen}'(1^k)$**:**

$(sk, pk) := \mathtt{gen}(1^k)$
sample $a \in \{0,1\}^k$
sample $b \in \{0,1\}^k \setminus \{a\}$
$sk' := sk \| a \| b$
$pk' := pk \| a \| b$
return (sk', pk')

Algorithm $\mathtt{sgn}'(sk', m)$**:**

unpack $sk' =: sk \| a \| b$
if $m = a$ **then**
  return $\mathtt{sgn}(sk, m) \| \mathtt{sgn}(sk, b)$
else
  return $\mathtt{sgn}(sk, m) \| \mathbf{0}$

Algorithm $\mathtt{vrf}'(pk', m, \sigma')$**:**

unpack $pk' =: pk \| a \| b$
unpack $\sigma' =: \sigma \| \eta$
if $m = a$ **then**
  return
    $\mathtt{vrf}(pk, m, \sigma) \wedge \mathtt{vrf}(pk, b, \eta)$
else
  return $\mathtt{vrf}(pk, m, \sigma)$