1 DBW Theory

Built: 17 June 2019
Parent Theories: SENplus

1.1 Definitions

[DBW_set_req_def]

```
⊢ ∀p TF EF BCU PC SC_a SC_d TS BS t.
      DBW_set_req p TF EF BCU PC SC_a SC_d TS BS t ⟺
      indep_sets p
        (λi.
             {if i = 0 then DRBD_event p TF t
              else if i = 1 then DRBD_event p EF t
              else if i = 2 then DRBD_event p BCU t
              else if i = 3 then
                DRBD_event p (WSP PC SC_a SC_d) t
              else if i = 4 then DRBD_event p TS t
              else DRBD_event p BS t}) {0; 1; 2; 3; 4; 5} ∧
      ∀i.
          i ∈ {0; 1; 2; 3; 4; 5} ⇒
          (λi.
               if i = 0 then DRBD_event p TF t
               else if i = 1 then DRBD_event p EF t
               else if i = 2 then DRBD_event p BCU t
               else if i = 3 then
                 DRBD_event p (WSP PC SC_a SC_d) t
               else if i = 4 then DRBD_event p TS t
               else DRBD_event p BS t) i ∈ events p
```

[UNIONL_def]

```
⊢ (UNIONL [] = {}) ∧ ∀s ss. UNIONL (s::ss) = s ∪ UNIONL ss
```

1.2 Theorems

[IN_REST]

```
⊢ ∀x s. x ∈ REST s ⟺ x ∈ s ∧ x ≠ CHOICE s
```

[IN_UNIONL]

```
⊢ ∀l v. v ∈ UNIONL l ⟺ ∃s. MEM s l ∧ v ∈ s
```

[Rel_DBW]

```
⊢ ∀p TF EF BCU PC SC_a SC_d TS BS t.
      DBW_set_req p TF EF BCU PC SC_a SC_d TS BS t ⇒
      (prob p
         (DRBD_series
            (λi.
```

```
            if i = 0 then DRBD_event p TF t
            else if i = 1 then DRBD_event p EF t
            else if i = 2 then DRBD_event p BCU t
            else if i = 3 then
              DRBD_event p (WSP PC SC_a SC_d) t
            else if i = 4 then DRBD_event p TS t
            else DRBD_event p BS t) {0; 1; 2; 3; 4; 5}) =
Rel p TF t × Rel p EF t × Rel p BCU t ×
Rel p (WSP PC SC_a SC_d) t × Rel p TS t × Rel p BS t)
```