

```
timescale 1ns / 1ps
////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
// Company:
// Engineer:
//
// Create Date: 05/31/2024 02:36:15 PM
// Design Name:
// Module Name: iceState
// Project Name:
// Target Devices:
// Tool Versions:
// Description:
//
// Dependencies:
//
// Revision:
// Revision 0.01 - File Created
// Additional Comments:
//
////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////

module iceState(
    input clk,
    input TZ,
    input T2,
    input T4,
    input underwater,
    input slug,
    input activate,
    output startTimer,
    output timerStartZ,
    output frzn,
    output fall,
    output fade,
    output spawn,
    output init
);
    wire [4:0] D, Q;

    FDRE #(.INIT(1'b1)) FF_spawn (.C(clk), .CE(1'b1), .R(1'b0), .D(D[0]), .Q(Q[0]));
    FDRE #(.INIT(1'b0)) FF_other [4:1] (.C({4{clk}}), .CE({4{1'b1}}), .R(4'b0),
.D(D[4:1]), .Q(Q[4:1]));

    assign D[0] = Q[0] & ~activate;
    assign D[1] = Q[1] & ~TZ | Q[3] & underwater | Q[4] & T2 | Q[0] & activate;
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assign D[2] = Q[1] & TZ | Q[2] & ~T4;
assign D[3] = Q[2] & T4 | Q[3] & ~underwater & ~slug;
assign D[4] = Q[3] & slug | Q[4] & ~T2;

assign startTimer = Q[1] & TZ | Q[3] & slug;
assign frzn = Q[4];
assign fall = Q[3];
assign fade = Q[2];
assign spawn = Q[1];
assign init = Q[0];
assign timerStartZ = Q[3] & underwater | Q[0] & activate | Q[4] & T2;
```

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endmodule
```