CLAIMS

1. A monitoring system (2) for cable, pipe or wire transits (1; 1a…1n) of a type which has a plurality of transit elements (10, 20, 30, 40; 42; 400) to be assembled into a sealed installation of one or more cables (2), pipes or wires at a site (5), the monitoring system comprising:

for each transit (1; 1a…1n), a transit guard unit (50; 50a-50n; 150; 250; 350; 450) configured to detect a condition indicative of whether the installation of the cables, pipes or wires in the transit is sealed or at least potentially not sealed, the transit guard unit being connectable to a communication network (60; 60a);

a central monitoring unit (70) configured to:

receive, over the communication network (60) or another communication network (60b), first information (110, 112) about the condition detected by the transit guard unit (50) of any of the transits (1a…1n);

register the particular transit (1a) as being in a first state (GREEN) when the received first information (110) indicates that the installation of the cables, pipes or wires in the transit is sealed;

register the particular transit (1a) as being in a second state (RED) when the received first information (112) indicates that the installation of the cables, pipes or wires in the transit is at least potentially not sealed;

while the particular transit (1a) is in the second state (RED), receive second information (114) about the condition detected by the transit guard unit (50a) of said particular transit (1a);

if the received second information indicates that the installation of the cables, pipes or wires in the transit is sealed, change the registered state of the particular transit (1a) to a third state (YELLOW); and

make the registered states (GREEN, RED, YELLOW) of the respective transits (1a-1n) available to a user (3, 4) of the monitoring system (2).

2. The monitoring system (2) as defined in claim 1, wherein the central monitoring unit (70) is configured to:

while the particular transit (1a) is in the third state (YELLOW), receive an authorization (116) from the user (4) of the monitoring system (2); and

in response change the registered state of the particular transit (1a) to the first state (GREEN).

3. The monitoring system (2) as defined in claim 1 or 2, further comprising for each transit (1a) a status indicator unit (90; 90’; 290; 390) which is configured to provide a local indication of the state of the transit (1a) at the site (5) where it is installed.

4. The monitoring system (2) as defined in claim 3, wherein the status indicator unit (90; 290; 390) is included in the transit guard unit (50; 250; 350; 450).

5. The monitoring system (2) as defined in claim 3, wherein the status indicator unit (90’) is a separate device being installed at the transit (1a).

6. The monitoring system (2) as defined in claim 4 or 5, wherein the transit guard unit (50) is configured to:

receive from the central monitoring unit (70) an instruction that the state of the transit (1) has changed to a new state; and

control the status indicator unit (90; 90’) to indicate the new state.

7. The monitoring system (2) as defined in claim 5, wherein the status indicator unit (90’) is configured to:

receive from the central monitoring unit (70) or the transit guard unit (50) an instruction that the state of the transit (1) has changed to a new state; and

indicate the new state accordingly.

8. The monitoring system (2) as defined in any of claims 4-7, wherein the status indicator unit (90; 90’) comprises one or more of the following:

a set of LED indicators (92; 192), each LED indicator being adapted for indicating a respective one of the first state (GREEN), the second state (RED) and the third state (YELLOW), when applicable;

a multi-color LED indicator being adapted for indicating a respective one of the first state (GREEN), the second state (RED) and the third state (YELLOW), when applicable; and

a display screen (94) being adapted to visualize the first state (GREEN), the second state (RED) and the third state (YELLOW), when applicable.

9. The monitoring system (2) as defined in any of claims 4-8, wherein the transit guard unit (50) or the status indicator unit (90') further comprises:

a memory (53; 93) for storing a status value (*Transit Status*) representing the first state (GREEN), the second state (RED) or the third state (YELLOW), as applicable; and

a short-range wireless communication interface (96),

wherein the transit guard unit (50) or the status indicator unit (90') is configured to make the status value (*Transit Status*) stored in said memory (53; 93) readable by an external inspection device (82) via the short-range wireless communication interface (96).

10. The monitoring system (2) as defined in any of the preceding claims, wherein the or one type of transit (1; 1a) comprises a compression unit (wedge) (40) actuated by one or more tightening members (41), and wherein the transit guard unit (50; 150) comprises:

a housing (154) adapted for mounting onto the compression unit (40) and having one or more recesses (156) for engagement with the one or more tightening members (41); and

a sensor (52; 152) located at the recess or one of more of the recesses (156) and adapted for detecting said condition as the transit guard unit (50; 150) being in place on the compression unit (40) or is removed therefrom, respectively.

11. The monitoring system (2) as defined in claims 8 and 10, wherein the housing (154) of the transit guard unit (150) also comprises said set of LED indicators (92; 192), said multi-color LED indicator or said display screen of the status indicator unit (90).

12. The monitoring system (2) as defined in any of claims 1-9, wherein the transit guard unit (50; 150) comprises a sensor (52; 152) adapted for detecting said condition as the presence or removal, respectively, of a transit element (10, 20, 30, 40, 42; 400) from said transit (1; 1a).

13. The monitoring system (2) as defined in any of claims 1-9, wherein the transit guard unit (50; 150; 250; 350; 450) comprises a sensor (452) adapted for

detecting said condition as the transit guard unit (50; 150; 250; 350; 450) being in place in said transit (1; 1a) or is removed from said transit (1; 1a), respectively.

14. The monitoring system (2) as defined in claim 12 or 13, wherein the transit guard unit (250; 350) is of the same general shape as one type of transit element (20) for said transit (1; 1a), or of a component (28) of said one type of transit element (20).

15. The monitoring system (2) as defined in claim 12 or 14, wherein the transit element (10, 20, 30, 40, 42; 400) or said one type of transit element is any one of the following:

a frame (10);
a compressible module (20);
a stayplate (30);
a compression unit (wedge) (40);
a wedge clip (42); and
a combined frame and compressible module (400).

16. The monitoring system (2) as defined in claim 14, wherein said one type of transit element is a compressible module (20) and wherein the transit guard unit (250; 350) has a housing (254; 354) of the same general shape as the compressible module (20), the transit guard unit (254; 354) being adapted to be mounted instead of the compressible module (20) in the transit (1; 1a).

17. The monitoring system (2) as defined in claim 14, wherein said one type of transit element is a compressible module (20) and wherein the transit guard unit (250; 350) has a housing (254; 354) of the same general shape as a core (28) of the compressible module (20), the transit guard unit (254; 354) being adapted to be mounted instead of the core (28) of the compressible module (20) in the transit (1; 1a).

18. The monitoring system (2) as defined in any of claims 12-17, wherein the sensor (52; 152; 452) is any of the following:

a pressure sensor;
a piezoelectric sensor;
an electric switch (152);
a magnetic switch;

a Hall Effect sensor;

a photo sensor.

19. The monitoring system (2) as defined in any preceding claim, wherein the central monitoring unit (70) is further configured to:

store associations between individual transits (1a…1n);

when a first transit (1a) is registered in the second state (RED):

determine whether the first transit (1a) is associated with at least a second transit (1b); and, if so

cause a forced registration of the second transit (1b) to be in the third state (YELLOW).

20. The monitoring system (2) as defined in any of claims 1-18, wherein the central monitoring unit (70) is further configured to:

store associations between individual transits (1a…1n);

when a first transit (1a) is registered in the second state (RED):

determine whether the first transit (1a) is associated with at least a second transit (1b); and, if so

cause a forced registration of the second transit (1b) to be in the second state (RED).

21. A transit guard unit (50; 50a-50n; 150; 250; 350; 450) for a cable, pipe or wire transit (1; 1a…1n) which has a plurality of transit elements (10, 20, 30, 40; 42; 400) to be assembled into a sealed installation of one or more cables (2), pipes or wires at a site (5), the transit guard unit being configured to:

detect a condition indicative of whether the installation of the cables, pipes or wires in the transit (1) is sealed or at least potentially not sealed;

transmit the detected condition via a communication interface (56) to a communication network (60; 60a) or via a short-range wireless communication interface (96) to a mobile device;

receive via the communication interface (56) or via the short-range wireless communication interface (96) an instruction that a state of the transit (1) has changed to a new state; and

cause indication of the new state to a user (3, 4) at the site (5).

22. The transit guard unit (50; 50a-50n; 150; 250; 350; 450) as defined in claim 21, wherein the new state is one of the following:

a first state (GREEN) to indicate that the installation of the cables, pipes or wires in the transit (1) is sealed;

a second state (RED) to indicate that the installation of the cables, pipes or wires in the transit (1) is at least potentially not sealed; and

a third state (YELLOW) to indicate that the installation of the cables, pipes or wires in the transit (1) has been restored to sealed but needs verification by an authorized user (4).